Accreditation and Associations

Commission on Colleges of the Northwest
Association of Schools and Colleges
Council of Graduate Schools in the United States
American Assembly of Collegiate Schools of Business
American Association for Accreditation of Laboratory Animal Care
American Association of Colleges for Teacher Education
American Association of Colleges of Pharmacy
American Camping Association
American Chemical Society
American Council for Construction Education Standards and Criteria
American Council on Pharmaceutical Education
American Dietetic Association
American Education Research Association
American Psychological Association
American Society of Agricultural Engineers
American Society of Landscape Architects
American Speech-Language-Hearing Association
American Veterinary Medical Association
Computer Science Network
Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology
Foundation for Interior Design Education Research
National Architectural Accrediting Board
National Association of Schools of Music
National Athletic Trainers Association
National Council for Accreditation of Teacher Education
National League for Nursing
National University Continuing Education Association
Society for Range Management
Society of American Foresters
State Board of Education
United States Department of Education
University Council on Education Administration
Washington State Board of Nursing
# Academic Calendar

## First Semester

<table>
<thead>
<tr>
<th>Event</th>
<th>1985-86</th>
<th>1986-87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Aug 22-23</td>
<td>Aug 21-22</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Aug 26</td>
<td>Aug 25</td>
</tr>
<tr>
<td>Labor Day—Classes meet</td>
<td>Sept 2</td>
<td>Sept 1</td>
</tr>
<tr>
<td>Midsemester grades due in Registrar's Office, 8:00 a.m., Friday</td>
<td>Oct 11</td>
<td>Oct 10</td>
</tr>
<tr>
<td>Thanksgiving vacation begins, 12:00 noon, Saturday</td>
<td>Nov 23</td>
<td>Nov 22</td>
</tr>
<tr>
<td>Thanksgiving vacation ends, 8:00 a.m., Monday</td>
<td>Dec 2</td>
<td>Dec 1</td>
</tr>
<tr>
<td>Final examinations, Saturday through Friday</td>
<td>Dec 14-20</td>
<td>Dec 13-19</td>
</tr>
<tr>
<td>Final grades due in Registrar’s Office, 8:00 a.m., Monday</td>
<td>Dec 23</td>
<td>Dec 22</td>
</tr>
</tbody>
</table>

## Second Semester

<table>
<thead>
<tr>
<th>Event</th>
<th>1985-86</th>
<th>1986-87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Jan 9-10</td>
<td>Jan 8-9</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Jan 13</td>
<td>Jan 12</td>
</tr>
<tr>
<td>Midsemester grades due in Registrar's Office, 8:00 a.m., Friday</td>
<td>Feb 28</td>
<td>Feb 27</td>
</tr>
<tr>
<td>Spring vacation begins, 12:00 noon, Saturday</td>
<td>Mar 8</td>
<td>Mar 7</td>
</tr>
<tr>
<td>Spring vacation ends, 8:00 a.m., Monday</td>
<td>Mar 17</td>
<td>Mar 16</td>
</tr>
<tr>
<td>Final examinations, Saturday through Friday</td>
<td>May 3-9</td>
<td>May 2-8</td>
</tr>
<tr>
<td>Commencement, 10:00 a.m., Saturday</td>
<td>May 10</td>
<td>TBA</td>
</tr>
<tr>
<td>Final grades due in Registrar’s Office, 8:00 a.m., Monday</td>
<td>May 12</td>
<td>May 11</td>
</tr>
</tbody>
</table>

## Summer Session

<table>
<thead>
<tr>
<th>Event</th>
<th>1985-86</th>
<th>1986-87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration, Monday</td>
<td>June 9</td>
<td>June 8</td>
</tr>
<tr>
<td>Classes begin, Tuesday</td>
<td>June 10</td>
<td>June 9</td>
</tr>
<tr>
<td>Independence Day (a holiday)</td>
<td>July 4 (Fri)</td>
<td>July 4 (Sat)</td>
</tr>
<tr>
<td>Eight-week session ends, Friday</td>
<td>Aug 1</td>
<td>July 31</td>
</tr>
<tr>
<td>Final grades due in Registrar’s Office, 8:00 a.m., Monday</td>
<td>Aug 4</td>
<td>Aug 3</td>
</tr>
</tbody>
</table>
Board of Regents

Mr. Booth Gardner
Governor of the State of Washington
Advisory Member Ex Officio

Dr. Vitt P. Ferrucci, President
Puyallup

Mrs. Kate B. Webster, Vice President
Bainbridge Island

Mr. Mac Crow
Oakesdale

Mr. Robert B. McEachern
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Mr. R. D. Leary
Othello

Mr. Edwin J. McWilliams
Spokane

Dr. Belinda K. Pearson
Seattle

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Pullman (to 6/30/85)

Dr. Samuel H. Smith, Secretary Ex Officio
Pullman (effective 7/1/85)

Mr. G. A. Hartford, Jr., Treasurer
(Appointed)
Pullman

Mrs. Robert F. DeVleeming, Executive
Assistant (Appointed)
Pullman

Meetings of the Board of Regents are
called periodically throughout the year.
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Dean and Resident Director, Joint Center for Graduate Study (Richland)
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Associate Provost for Extended University Services

Thomas L. Kennedy, PhD
Associate Provost for Instruction
M. Stephen Lilly, PhD
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Ernest Renfro, BA
Assistant Vice President-Controller
Larry M. Simonsmeier, JD
Dean, College of Pharmacy
Robert B. Wilson, PhD
Dean, College of Veterinary Medicine
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Washington State University
Washington State University is the land-grant university of the state of Washington. It is located in one of the world's richest agricultural regions—the Palouse country of southeast Washington—where some of the nation's finest wheat and other grain crops are produced annually.

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 in Spokane, the Center for Hotel and Restaurant Administration in Seattle, and the Southwest Washington Joint Center for Education in Vancouver. Undergraduate and graduate programs are also offered through the Joint Center for Graduate Study in Richland, Washington. The center is jointly operated by Washington State University and the University of Washington.

Washington State University offers strong and diversified programs of instruction. From its founding in 1890, liberal arts and sciences have occupied an important place in the curriculum along with business, education, nursing, pharmacy, and the traditional land-grant programs in agriculture, home economics, veterinary medicine, and engineering. WSU now offers more than 90 major fields of study to undergraduate students. The bachelor's degree is available in all major areas, 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 faculty is charged with the development of instructional methods that will open students' minds to the most recent knowledge and discoveries. The WSU Honors Program is one of the few all-university programs for superior students at a major American institution of higher learning. In recent years, programs in environmental science, Asian American studies, Black studies, Chicano studies, international business, Native American studies, speech pathology, and women studies have been added to the curriculum. Doctoral programs in business administration, chemical, civil and environmental, electrical and computer, and mechanical engineering were initiated in 1984.

Washington State University is one of the largest residential universities west of the Mississippi. Of the student body, approximately 14,500 undergraduates and 2,000 graduate students, about half live on campus in university housing or in fraternities or sororities. Here, students of diverse social, economic, and ethnic backgrounds from throughout the nation and more than 80 foreign lands come together in a community in which education is the principal industry and human development the primary concern. The heart of student life is the educational, cultural, and social programs of the university; the opportunity for students to know and work closely with their instructors is one of the advantages of a residential campus. The pattern of residence living and the natural setting of the university combine to produce a community dedicated to student educational and social growth. The faculty includes a substantial number of scholars with noteworthy reputations in their areas of specialization.

Accreditation

Washington State University is accredited by the Commission on Colleges of the Northwest Association of Schools and Colleges, the regional accrediting association. The institution is a member of the National University Continuing Education Association and is listed in the official publications of the U.S. Office of Education and the State Department of Public Instruction.

Many departments and colleges are accredited by professional accrediting associations recognized by the Council on Postsecondary Accreditation. This information is included in the introductory material of the various departments and colleges, and an abbreviated list is printed on the inside front cover of this catalog.
Degrees Granted

ACADEMIC DEGREES

Accounting, M Acct
Adult and Continuing Education, MACEd
Agricultural Economics, BS, MA, PhD
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, MS
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, PhD
Chemical Engineering, BS, MS, PhD
Chemical Physics, PhD
Chemistry, BS, MS, PhD
Chicano Studies, BA
Child and Family Studies, BA, MA
Civil Engineering, BS, MS, PhD
Clothing and Textiles, BA
Communications, BA, MA
Computer Science, BS, MS, PhD
Construction Management, BS
Criminal Justice, BA, MA
Economics, BA, MA, PhD
Education, BA, EdM, MA, EdD, PhD
Electrical and Computer Engineering, PhD
Electrical Engineering, BS, MS
Engineering, 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, 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, BS, MS
Mathematics, BS, MS, DA, PhD
Mechanical Engineering, BS, MS, PhD
Music, BA, B Mus, MA
Nursing, BS, M Nurs
Nutrition, MS, PhD
Pharmacology and Toxicology, MS, PhD
Pharmacy, B Phar
Philosophy, BA
Physical Education, BS, MS, PhD
Physics, BS, MS, PhD
Plant Pathology, MS, PhD
Plant Physiology, 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 and Wildland Recreation Management, BS
Wildlife Biology, BS, MS
Zoology, BS, MS, PhD
Zoophysiology, PhD

CERTIFICATES

Provisional (for teaching)
The Campus

Washington State University is located at Pullman in the southeastern part of the state. Modern classroom buildings, special research and instructional equipment, student living accommodations, libraries, hospital facilities, auditoriums, gymnasiums, and administrative offices are located in the central part of the campus for easy access by students and visitors. In addition to the main campus, the university maintains thousands of acres of farmland and agricultural research centers at various locations throughout the state.

In the last few years, a number of important buildings have been constructed on the campus. These include a performing arts coliseum with a seating capacity of over 12,000—the largest unit of its kind on any university campus in the Pacific Northwest—a biological sciences building, a science and engineering library, a computer science building and a computing center, a communications building, a fine arts building including galleries, and a multistory physical sciences building. The stadium has been expanded, and new track and field and baseball facilities were recently completed.

A nine-hole golf course, 16 all-weather tennis courts, and several swimming pools, including one of Olympic dimensions, are located on the campus. In addition, special playing fields afford an opportunity for fall and spring outdoor intramural competition in a variety of sports. WSU has one of the largest university-sponsored intramural programs in the nation, and the nearby hills and streams provide ample opportunity for individual activities such as skiing, hiking, fishing, picnicking, and camping.

The Libraries

The University Libraries are an integral part of the educational facilities. Books, journals, newspapers, microfilms, technical reports, maps, manuscripts, art prints, and photographs form resources of more than three million items supporting commitments in teaching, research, and public service. The libraries are depositories for U.S. documents, municipal and state documents, those from foreign countries, as well as publications of the U.N.

Reference librarians provide personal assistance using modern methods of information retrieval. For the most part, collections are maintained in easily accessible, open stack arrangements. Quiet study areas are available, as are a limited number of carrels for graduate students and others engaged in research. Special service programs include instruction in library use accessing national computerized information systems; and accessing resources of other libraries, national and international, through inter-library cooperation.

Holland Library provides strong collections in the social sciences and the humanities, as well as sophisticated service components designed to assist students, faculty and researchers in utilizing these resources. Manuscripts, Archives, and Special Collections contains rich collections of primary resource materials—books, manuscripts, photographs—to support study and research in a number of fields, including Pacific Northwest history, modern British literature, regional publishing, veterinary history, agricultural history, wildlife and outdoor recreation, WSU history, and other subjects. Instructional Media Services provides a comprehensive collection of materials, equipment, and services to obtain, design, produce, and display audiovisual materials, IMS provides projection and sound systems for all lecture halls and performs media system design and maintenance in support of university programs.

Owen Science and Engineering Library, whose collections support study and research in the pure and applied sciences, is the largest and most technologically advanced facility in the Pacific Northwest. Its campus location places it convenient to most departments served by its collections.

The Fischer Agricultural Sciences (Branch) Library is in Johnson Hall Annex, centrally located within the agricultural science complex on campus.

The Veterinary Medical/Pharmacy Library is located in Wegner Hall, convenient to the disciplines it serves.
The Education Library, in Cleveland Hall, offers a wide range of materials and services to meet research and instructional needs from preschool through community college and adult education.

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 February 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.
Student Life
Student Life

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, craft area, guest rooms for campus visitors, movie theater, copy center, satellite video 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, film processing service, and bank exchange machine.

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.

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 percent of their course work in liberal arts, and have earned at least 45 of their total credits from WSU with a minimum 3.45 g.p.a. 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 percent of the senior class and the top five percent 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) Senate. 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 senate is directly involved in the allocation of ASWSU funds for programming and the establishment of operating procedures. Through the senate, ASWSU has de-
developed a number of student committees and programs in the areas of education, entertainment, and recreation.

Graduate and professional students are members of the Graduate and Professional Students Association (GPSA). Five members of the GPSA represent their constituents on the Faculty 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 August to over 10,000 buyers. The Chinook is one of the top five university and college yearbooks in the U.S.
Student Services and Facilities
Academic Development Program

The Academic Development Program provides educational opportunities and retention services for students throughout the university. Specifically, the program offers academic advising and counseling, some diagnostic testing, individual and group instruction, assistance to students with special learning needs, and basic computer skills labs. Instruction in reading, writing, science, math, and study and test taking skills is available. Tutorial assistance in most General University Requirement courses is provided without charge to participating students. For those who wish to arrange for private tutoring, a roster of qualified tutors in a number of subject areas is available from the ADP.

Students may be assigned an adviser in the Academic Development Program upon entrance to the university or as a retention condition. Students may also be referred to the ADP at any time by faculty members, counselors, and others for any of the services it provides. The ADP staff is available daily in the Administration Annex, Room 101, (509) 335-9602.

Career Services

Career Services is a student service. Three goals have been identified which are aimed at assisting students during their residence at Washington State University: (1) to aid students in defining career goals and aspirations while presenting them with future viable employment opportunities, (2) to assist students in setting themselves on a path to success, and (3) to bring together qualified applicants and prospective employers in a mutually-satisfying manner. In order to accomplish these goals, Career Services has developed many programs/services which benefit all students.

The Professional Experience Program (PEP) is a cooperative education effort uniting the student, the employer, and the academic department. Two purposes of this program are to help the student learn by using work experience as a supplement to textbooks, and to apply what has been learned in the classroom. With over 1,500 internship opportunities generated every year in areas such as engineering, business, computer science, and the humanities, opportunities are endless in gaining work experience in the major field while earning college credit. Students may often find that upon graduation, an internship experience gives them that edge for employment in the career of their choice, and, subsequently, leads to earlier promotions in that career. PEP will help students find an internship related to their major. The three-year-old program has already placed over 1,000 students in internships that have proved to be invaluable experiences. To participate in PEP, drop by Career Services, located in the Administration Annex Building across from Todd Hall.

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.

Counseling and Service Programs

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

The Asian American Student Counseling Office provides services in all areas of advising including college adjustment, choosing majors, financial problems, homesickness and all kinds of academic and personal issues that are relevant to students. It is also a contact point socially for all Asian American students to socialize with each other. The office attempts to emphasize the need of an ethnic identity and of a bicultural lifestyle.

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.

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.

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.

Disabled Student Services

The Disabled Student Services Program operates through the Office of Supportive Services Programs. This program plans for and coordinates services for students with physical disabilities and permanent health problems, and works with other agencies within the university to increase accessibility and sensitivity to the needs of disabled 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.

Office of Programs for Women

The Office of Programs for Women (OPW), located in Holland Library 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.

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.

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 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; the mandatory student health fee is charged at the time of registration. In addition, nominal charges may be made for supplies used in caring for patients.

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 between 8:00 a.m. and 5:00 p.m., Monday through Friday. In addition, the clinic is open for “sick calls” only from 9:00 a.m. to 12:00 noon, Saturdays. Emergencies will be seen at any time. There is a fee charged to patients coming in outside of regular clinic hours.

Students enrolled in seven or more credit hours can also purchase a supplemental hospital-accident plan at a very reasonable cost.

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

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. weekdays.

James Entomological Museum
One of the largest insect collections in the Pacific Northwest, the Maurice T. James Collection houses nearly one million insect specimens and an extensive working library. Adults and immature stages of all insect groups and many related arthropods are represented with particular strengths in the flies, beetles, and butterflies. Primarily of regional significance, the collection also includes considerable material from the New World tropics, eastern North America, and Europe. The collection functions essentially as a research facility by providing specimens on loan to recognized scientists worldwide, by offering identification services to university extension entomologists, and by serving as a repository of type specimens and other materials. Public tours and interpretive presentations for groups can be arranged in advance by calling 335-3720. The collection room is located at the west end of Johnson Hall (385) on the third floor.

Mycological Herbarium
The Mycological Herbarium of Washington State University is housed in, and maintained by, the Department of Plant Pathology, third floor, Johnson Hall. The herbarium was founded by Frederick D. Heald, the first chairman of the department, in 1915 and now contains more than 65,000 specimens of fungi. Included are representative materials of all the major groups from the slime molds and true molds to the larger, fleshy mushrooms. The parasitic fungi of northwestern North America have been emphasized; however, through exchange and purchase, representative material of all groups from all over the world has been incorporated. Loans are freely available to individuals associated with recognized botanical institutions anywhere in the world. Specialists wishing to utilize the facilities of the Mycological Herbarium are welcome, and are asked only to inform the Department of Plant Pathology (509-335-9541) of their desires in advance so that members of the department may be of maximum assistance to them.

Ownbey Herbarium
The Marion Ownbey Herbarium is an internationally recognized research, teaching, and service resource. Located in Heald G9, the collections include 290,000 specimens of vascular plants including native plants, weeds, cultivated plants, seeds, and mosses. The herbarium is open from 8:00 a.m. to 5:00 p.m., five days a week and by appointment. The director and staff provide assistance to persons wanting to identify and learn about plants. Facilities include a library, reprint collections, computers, and special botanical indices.

Culver Display and Collection
The Culver Display, located in the Physical Sciences Building, houses the Jacklin Petrified Wood Collection. This spectacular collection contains more than 2,000 cut and polished specimens of petrified wood from all major localities in the western U.S. It is the largest display of its kind in the western U.S. Also included in the collection is a large selection of cut and polished agate, geodes and dinosaur bone.

The Culver Collection includes over 100 classic rock and mineral specimens from localities throughout the world. Both the Jacklin and Culver Collections may be viewed Monday through Friday, 8:00 a.m. to 5:00 p.m. Group tours may be arranged for weekend days by calling the Department of Geology.

Smith Soil Monolith Collection
The Henry W. Smith Soil Monolith Collection contains more than one hundred and fifty preserved soil profiles, some as much as eight feet in length, representing soils from all of the geographic regions in the state of Washington and eight of the ten soil Orders in Soil Taxonomy. Soils that are particularly well represented in the collection are those of the Palouse region and those from eastern and central Washington that contain layers of volcanic ash from the many prehistoric and historic eruptions of volcanoes in
the Cascade Region. The collection is the work of Dr. Henry W. Smith, emeritus professor of soils at Washington State University. The soil monoliths constitute a very valuable resource for both teaching and research within the Department of Agronomy and Soils. The collection is located in Johnson Hall, 114 and may be viewed from an observation window any time the building is open. Persons or groups interested in touring the collection should contact Dr. Alan Busacca at 335-1859.

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 a program which embraces a wide variety of exhibitions ranging from antiquity to the contemporary, from design and architecture to sculpture and painting, 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 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 during the fall and spring semesters.

Drucker Collection

The Minnie Barstow Drucker Memorial Collection of Oriental Art is housed in White Hall. The Drucker Collection consists of Oriental furniture, accessories, art, textiles, and costumes. The collection was given to the university in 1944 by the late Arthur Ellert Drucker in memory of his wife. The Chinese, Korean, and Japanese artifacts were collected during the years the Druckers made the Orient their home. The collection may be viewed in White Hall by writing directly to the Department of Clothing, Interior Design, and Textiles or by calling 335-3823 for an appointment.

Music and Theatre

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

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.

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.
Radio-Television Services

Radio-Television Services operate four radio stations, one television station, and WSU Instructional Telecommunications.

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, and a new FM stereo station serving the Palouse region signed on August 1, 1984. These FM stations are primarily programmed at KWSU but are broadcast from transmitters located near Kennewick, WA and Moscow, ID. Together, the three NPR radio stations reach some 800,000 potential listeners in the Inland Northwest.

KUGR is a student-operated cable station. KWSU-TV, a member of the Public Broadcasting Service (PBS), produces and broadcasts local and national programs. The instructional support operation produces materials for academic departments, provides viewing carrels and portable video equipment services, programs Pullman cable Channel 8 and Spokane cable Channel 18, and operates the Washington Educational Telecommunications System, a statewide microwave network. Students are used extensively on the working staff in the operation.
Educational Enhancement
Educational Enhancement

Continuing Education and Public Service

Continuing Education and Public Service (CEPS) is responsible for extending the educational resources of the university to people throughout the state of Washington. Through its divisions, CEPS works in cooperation with university departments to meet the educational needs of individuals and communities by developing and delivering courses, programs, and technical assistance.

The Division of Graduate and Professional Programs sponsors off-campus credit and noncredit, independent study, and community course programs. The Off-Campus Credit Program offers graduate and undergraduate courses in areas such as agriculture, education, business, engineering, and health sciences. Several degree programs are available at various locations throughout the state. The Independent Study Program includes video-tape and correspondence courses which allow independent and highly motivated individuals to work at their own pace. Up to 25 percent of the credits for a baccalaureate degree may be taken from WSU by correspondence. The Community Course Program provides a service to the local community by sponsoring a variety of credit and noncredit offerings through short courses, workshops, evening and daytime classes. For more information about these programs, call (509) 335-3557.

The Division of Conferences and Institutes plans and conducts conferences, institutes, seminars, short courses, and workshops in Pullman and various locations throughout the Northwest and Canada. The division draws upon the instructional resources of the university and outside content experts to meet a diversity of continuing education, professional, and training needs. Clients include business and industrial firms, schools, professional associations, and other interest groups who seek to increase their knowledge and professional competencies. For more information about programs and services provided by conferences and institutes, call (509) 335-2850.

The Office of Community Service is a clearinghouse to match community service requests with faculty expertise and institutional resources. The Community Service Office coordinates the Partnership of Rural Improvement network, the statewide consortium of universities, community colleges, and governmental and public agencies dedicated to the improvement of the quality of living. The office assists with community and organizational development, program and project planning consultation, group and process facilitation, and training on a variety of subjects such as group dynamics, citizen participation, program evaluation, and leadership development. The Office of Community Services is also the state center for Community Education Development. Community education programs in over 150 school districts provide programs ranging from personal development to certification and advanced training. For more information about community services, call (509) 335-5509.

University Honors Program

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 percent 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.

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).

Intensive American Language Center
The Intensive American Language Center provides concentrated English language training for non-native speakers of English who are preparing for university studies or who seek to improve their English for professional or personal purposes. Classes meet five hours per day, five days per week for eight-week sessions that run concurrently with WSU's academic calendar. Thus, students who wish to enter WSU and who are otherwise eligible for admission can move directly to university studies upon successful completion of the Language Center curriculum.

The Language Center provides classes in reading, composition, grammar, listening and conversation, using both in-class and language laboratory training. Advanced students prepare to take the TOEFL examination, which is required for admission to most universities. At the beginning of their program, students are placed in classes and levels according to their individual proficiency in English.

Any non-native speaker of English, who is at least eighteen years of age and has completed secondary school may attend the intensive American Language Center. The Language Center is also prepared to negotiate special courses or package programs with domestic and foreign agencies on a contract basis. To apply or to obtain more information about the Language Center, contact the Office of International Programs, Room 108, Bryan Hall, 335-4508.
Study Abroad Programs

Washington State University offers exchange programs with University College, Cardiff, Wales; Friedrich Wilhelms University, Bonn, Germany; Linköping University, Sweden; Nihon University, Tokyo, and Kansai University of Foreign Studies, Osaka, Japan; St. Stephens College, India; Sichuan Institute of Foreign Languages, and Chengdu University of Science and Technology, People’s Republic of China; 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, Seville, or Alicante through the Council on International Educational Exchange (CIEE). Washington State University is also a member of the Northwest Inter-institutional Council for Study Abroad (NICS), a consortium which offers programs in London, Avignon, Guadalajara, 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.
Research Facilities
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, Milten/Wylbur/Oryvyl, 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.

Electron Microscopy Center

The Electron Microscopy Center (EMC), located in Science Hall, is available for training and research in science and technology. Washington State University students, staff, and faculty members 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, and EDX), a scanning electron microscope (SEM) also with EDX, and a full complement of ancillary facilities and equipment. The center has a skilled staff experienced in handling a wide range of research problems in electron microscopy.

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 and 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.

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.

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.

Laboratory for Atmospheric Research

The Laboratory for Atmospheric Research provides a recognized center for atmospheric studies at Washington State University. The laboratory, which is administered through the College of Engineering and Architecture, provides students with graduate training in the atmospheric sciences. The academic program is administered through the Department of Civil and Environmental Engineering. Students are encouraged to participate in the various grant-supported research projects of the laboratory. Since atmospheric research requires an interdisciplinary approach, both the faculty within the laboratory and those who work cooperatively on joint research programs have diverse disciplinary backgrounds. Research areas include those of interest to the citizens and industries of the state, the nation, and the world. Thus, the laboratory is engaged in research aspects of meteorology, atmospheric chemistry, pollution abatement, global climate issues, and effects of atmospheric pollutants. Much of the research involves field measurement programs which have taken the faculty, staff, and students to such diverse places as China, the Antarctic Continent, the Caribbean, and the Pacific Ocean, as well as numerous sites in the United States. Sampling platforms used include mobile trailers, towers, aircraft, and ships. Analytical technique development in the laboratory and computerized data interpretation including atmospheric modeling round out the laboratory research.

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 1967, 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 tubes, and a 14 MeV neutron exposure facility. Equipment for use in experiments includes microprocessor based multi-channel analyzers, large volume Ge(Li) detectors, 5" x 5" Na(Tl) detectors, NDE620 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 permea-
tion chromatography and high performance liquid chromatography. Trace element analyses are performed for other groups on the university campus.

Social and Economic Sciences Research Center

The Social and Economic Sciences 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 and Economic Sciences 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 and Economic Sciences 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.
Admission and Financial Aid
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 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

Freshman applicants will be admitted on the basis of an Admissions Priority Number (APN) which will be calculated using the high school grade point average and test information taken from the results of the Washington Pre-College Test. For nonresidents and other applicants who have not been able to complete the Washington Pre-College Test the scores of the College Board Scholastic Aptitude Test (SAT) or the American College Test program (ACT) may be substituted. The APN which will qualify a student for admission will be set on the basis of the number of students who can be accommodated and may be variable from year to year. The APN will be calculated using the grades accumulated at the end of 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.

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.

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 December 15.

A complete application includes the application form and official high school transcript, the Washington Pre-College Test data sheet or the score report of the SAT or ACT and a $15 nonrefundable application fee.

Beginning with students applying for freshman admission for the fall semester 1988, applicants will be required to submit a high school transcript showing completion of no less than the following course work in grades 9, 10, 11, and 12:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>English:</td>
<td>Four years (including at least one year each of composition and literature)</td>
</tr>
<tr>
<td>Mathematics:</td>
<td>Through geometry and trigonometry</td>
</tr>
<tr>
<td>Science:</td>
<td>Two years (including at least one year of laboratory science)*</td>
</tr>
<tr>
<td>Social Science:</td>
<td>Three years (including at least one year of history)</td>
</tr>
<tr>
<td>Foreign Language:</td>
<td>Two years of a single language</td>
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</table>
Students applying for admission before 1988 should seek to meet these requirements as nearly as possible.

*It is strongly recommended that students planning to major in science or science related fields complete at least three years of science (including at least two years of laboratory science)

**Retention of Students**

The grade point average for freshmen entering from high school in the fall semester 1983 was 3.14. Of the 2259 freshmen who entered in the fall semester 1983 from the state of Washington, 2010 were enrolled in the spring of 1984, and 1694 were eligible to continue their enrollment in the fall semester of 1984.

**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 10 semester (15 quarter) hours of transferable credit must submit their high school transcript for review. Applicants with 10 or more semester (15 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 80 semester (90 quarter) hours toward a baccalaureate degree irrespective of whether 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 57 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 June 1. Applications for spring semester admission are accepted from September 15 to December 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.

Washington State University recognizes academic credits earned at other accredited collegiate institutions which are essentially equivalent in academic level and nature to work offered at WSU. Toward this end, the university subscribes to the Policy on Inter-College Transfer and Articulation Among Washington Public Colleges and Universities endorsed by the public colleges and universities of Washington and the State Board for Community College Education, and published by the Council for Postsecondary Education. The policy deals with the rights and responsibilities of students and the review and appeal process in transfer credit disputes. For more detailed information, contact the WSU Office of Admissions.
Limited Enrollment Programs

Since academic departments may establish additional requirements for admission or certification to specific programs, eligibility for admission to Washington State University does not ensure acceptance into any department or program as a certified major and degree candidate. Several academic programs including, but not necessarily limited to, architecture, business administration, communications, computer science, construction management, economics, education, 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 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 by February 15; 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. 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 departmental 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 the 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 Director 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 71 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 July 1 for fall semester and December 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 enrolled 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 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 December 15 for spring semester for all 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.
Expenses and Financial Aid

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th>Washington Residents</th>
<th>Washington Nonresidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>$1,606</td>
<td>$4,462</td>
</tr>
<tr>
<td>Room and board</td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td>(based on double occupancy and 20 meals per week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks and supplies</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Transportation</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>Personal expenses</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Mandatory health fee</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Medical Expense Insurance (optional)</td>
<td>150 (est.)</td>
<td>150 (est.)</td>
</tr>
</tbody>
</table>

1 Subject to change by the Board of Regents.
2 Estimated cost.
3 Required of all foreign students.

Other costs: $15 refundable damage deposit required of all students; $60 security deposit required of those living in residence halls; $25 motor vehicle registration for on-campus students, $35 for off-campus students.

Tuition and fees must be paid in full at registration. Incoming students receive information about registration and orientation activities prior to coming to campus.

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.

Disabled Students

The state of Washington administers several programs of assistance to needy disabled 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 disability 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.

Federal Veterans Benefits
The Veterans Affairs Office, 346 French Administration, 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.

Students should apply for admittance to the university and for VA benefits simultaneously. Application for benefits should be made to the Veterans Administration Regional Office in Seattle or the WSU Coordinator of Veteran Affairs at least two months prior to the student's expected enrollment. There is currently a two-month delay between approval of the application and receipt of monthly benefit checks for most recipients, and four to six months delay for Chapter 32 and Section 901/902 veterans.

Veterans receiving benefits under the old G.I. Bill or Chapter 35 Vocational Rehabilitation may be eligible for tutorial assistance and work study. Eligible dependents may be eligible for tutorial assistance. Application forms and information can be obtained from the Coordinator of Veterans Affairs.

State Veterans Benefits
Veterans who (1) served in the Southeast Asian theatre of operation between August 5, 1964, and May 7, 1975, (2) received other than dishonorable discharge and (3) qualify as a Washington resident under RCW 28B.15.012, may qualify for the Vietnam Veterans Tuition Increase Exemption. Veterans claiming this special exemption should apply by providing proof of required service to the WSU Coordinator of Veteran Affairs.

Qualified Vietnam Veterans are exempted from the payment of general tuition and operating fees (service and activities fees will not be waived).

To qualify for this exemption, the veteran must:
2. Have been released from service with other than dishonorable discharge.
3. Have completely exhausted all federal educational and vocational benefits including any extensions.
4. Have been enrolled at Washington State University prior to October 1, 1977.
5. Maintain full time enrollment and be a full fee-paying student.
6. Apply the exemption toward the completion of a degree program in which the veteran was working at the time federal benefits were exhausted.
7. Be a legal resident of the state of Washington (as described in RCW 28B.15.012), and
8. Apply for the exemption through the Office of Veterans Affairs prior to the tenth class day each semester.

The children of any veteran who was a Washington domiciliary and who had been determined by the federal government to be a prisoner of war (POW) or missing in action (MIA) in Southeast Asia including Korea (1962 or thereafter), will be admitted to Washington State University without the necessity of paying tuition or fees, provided that such student meets standard admission requirements. Prospective students who wish to qualify for this exemption should contact the Coordinator of Veterans Affairs.
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, Student Accounts Section, 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 Age 60 and Over

Persons age 60 or over who are residents of the state of Washington may enroll under the tuition and fee waiver. Applicants will be asked to sign a statement that courses taken under the fee waiver will not be used toward credentials or salary schedule increases. Tuition-exempt students will be admitted to class on a space available basis. All students enrolling under the fee waiver are responsible for paying a $5 nonrefundable registration fee, plus any special course fees.

Courses numbered 499, 600, 700, 702, and 800; internships; and self-sustaining courses may not be taken under the fee waiver.

Credit Enrollments. Enrollment for credit under the fee waiver is limited to 6 hours per semester or 3 hours per summer session. Applicants must be admitted to the university and obtain the fee waiver form from the Registrar's Office, prior to registration. Detailed procedures for credit enrollments under the fee waiver are listed in the Time Schedule.

Audit Enrollments. Auditing under the fee waiver is limited to two courses per semester or summer session. Laboratory courses may not be audited. Applicants wishing to audit should report to the Registrar's Office during the first week of classes to obtain the "Permission to Audit" card. The instructor's signature is required for auditing and cannot be obtained prior to the first day of classes.

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.
Housing
Living Facilities

The university has residence hall space for 5,941 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, WA 99164-1012.

Twenty-four national social fraternities and 14 national social sororities currently maintain chapters at Washington State. The chapters vary in size from 30 to 130 people. For information write: Panhellenic and/or Interfraternity Council, McCroskey Hall, Pullman, WA 99164-3410.

Students living in residence halls, fraternities, and sororities elect their own officers, and each affords many opportunities for leadership experience. Panhellenic considers matters of common interest to sororities, while the Interfraternity Council represents the fraternities. The Residence Hall Association acts on behalf of the 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/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/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/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 1985-86 academic year is estimated to be $2400; for the 1986-87 academic year, $2560. 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. Once the applicant has been assigned to a hall, the security deposit is initially held to ensure occupancy of the space, and then to guarantee against damage, breakage, and loss during a student's stay in the hall. The deposit is held until the individual permanently leaves the residence hall system.

All students residing in the 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 500 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, Housing and Food Services, French Administration Building, Pullman, WA 99164-1012.

Single Student Apartments

The university operates 419 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, WA 99164-1012.
Tuition and Fees
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 legislature of the state of Washington and adopted by the WSU Board of Regents. Money amounts are listed for advisory purposes only, and may change following publication of this catalog. The fees listed below are based on legislation pending at press time. Actual tuition and fees are those published in the Time Schedule just prior to the start of each semester. Summer charges are published in the Summer Bulletin.

**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 payment fee.*

<table>
<thead>
<tr>
<th>FULL TIME(^1)</th>
<th>Resident</th>
<th>Nonresident</th>
<th>Nonresident (19 and above)</th>
<th>Resident (19 and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate (7-18 credit hours)</td>
<td>$803.00</td>
<td>$2231.00</td>
<td>$264.00</td>
<td>$264.00</td>
</tr>
<tr>
<td>Graduate (7-18 credit hours)</td>
<td>1160.00</td>
<td>2888.00</td>
<td>264.00</td>
<td>264.00</td>
</tr>
<tr>
<td>DVM</td>
<td>1877.00</td>
<td>4763.00</td>
<td>364.00</td>
<td>364.00</td>
</tr>
<tr>
<td>WAMI</td>
<td>1802.00</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PART TIME (1-6 credit hours)(^1)</th>
<th>Resident</th>
<th>Nonresident</th>
<th>Nonresident (1-6 credit hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>80.00</td>
<td>223.00</td>
<td>26.00</td>
</tr>
<tr>
<td>Graduate</td>
<td>116.00</td>
<td>289.00</td>
<td>26.00</td>
</tr>
<tr>
<td>DVM</td>
<td>188.00</td>
<td>476.00</td>
<td>36.00</td>
</tr>
</tbody>
</table>

\(^1\)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 46 of this Catalog.

**ADVANCE PAYMENT** (see p. 33)

$50.00

**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 and/or AGHE 407 only) one block $637.00

two blocks $803.00

Pullman High School Cooperative Program $108.00

Psych 595 only $75.00
Tuition and Fees

VMS 562 and 567 .............................................. 929.00
FRM 407, 517, and 545 ........................................ 50.00
No-Credit Graduate Enrollment (annual) .................. 38.00

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) 25.00
Basic Skills Proficiency Test .................................. 35.00
Challenging a Course
  charge for each challenge examination petition (only matriculated
  students currently registered at WSU are eligible) ............... 75.00
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 ..................... 25.00
ID card, charge for replacement .................................. 10.00
Late payment after 5th day of semester ......................... 15.00
Late registration on or before 10th day of semester .......... 15.00
Late registration after 10th day of semester .................. 50.00
Medical Expense Insurance (optional for all but foreign students) est. annual 150.00
Microfilming
  applicable to PhD and EdD degree candidates only ............ 42.00
Placement Bureau Credential Service
  fee assessed after graduation for each set of credentials .......... 3.00
Re-enrollment Fee (charged to students who pay tuition and
  fees after disenrollment for nonpayment) ..................... 50.00
Sponsored Foreign Student Administrative Charge (fall or spring)
  (summer) .................................................. 150.00
  75.00
Sports Pass (optional)
  Fall and Spring Semester All Sports Pass ........................ 50.00
  Fall Semester Sports Pass .................................... 40.00
  Spring Semester Sports Pass .................................. 25.00
Student Health Fee (per semester)
  fee assessed to all full time students ......................... 30.00
Teacher's Statutory Certification .................................. 17.00
Transcript (per copy) ............................................. 3.00
Veterinary Medicine application .................................. 25.00
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 Director of Admissions, the institutional official appointed to make 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. During the first year of official assignment to a station in the state of Washington military personnel and their spouses and dependent children may request a waiver of nonresident tuition and fees.

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 and all supporting evidence must be submitted to the Office of Admissions no later than the 30th calendar 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; (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; (4) is an active duty military personnel of field grade or lower rank, or the spouse or dependent child of such person, for the first twelve months stationed in the state of Washington; or (5) is an immigrant having refugee classification from the U.S. Immigration and Naturalization Service or the spouse or dependent child of such refugee, if the refugee (a) is on parole status, or (b) has received an immigrant visa, or (c) has applied for United States citizenship. Exemption from nonresident tuition and fee differential shall apply only during the term(s) such person shall hold such classification, appointment, 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 four days of the official start of the session. After the fourth 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.
Academic 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 policies and procedures for dropping and adding classes are included in the Time Schedule, available in the Registrar's Office. Registration is held just prior to the start of each term with class schedules/fee statements distributed the day before classes begin. For the fall and spring semesters, students have one week to pay tuition and fees. For summer session, fees must be paid at the time of registration.

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.)

Student ID Card

Student photo ID cards are required for library privileges, admission to events and activities, obtaining and cashing checks, and general university use. New students will have their photos taken during orientation week. Photo ID cards are validated each semester during registration. The photo ID card and the athletic sports pass are required for all WSU athletic events. The photo ID card with validated food service privileges will be required for service in all university dining halls.

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.

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 undergraduate 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: Based on credit hour enrollment. See page 41 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 deferments on National Direct Student Loans and Guaranteed Student Loans, with no break in enrollment, require at least half-time enrollment (6 semester hours) for undergraduate and graduate students. Five semester hours constitutes half-time enrollment for a graduate student on a half-time assistantship.

Guaranteed Student Loans deferments, with a break in enrollment, require full-time enrollment (12 semester hours) for undergraduate and graduate students. Ten semester hours will constitute full time for a graduate student on half-time assistantship.

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

Veterans' Benefits: Requirements for Veterans' Benefits under Chapter 34 (G.I. Bill), Chapter 35 (War Orphans Act), Chapter 31 (Vocational Rehabilitation), Chapter 32 (VEAP program), and Section 901/903 (test G.I. Bill) 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.

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.

Cancellation of Enrollment

(See Academic Regulations, Rule 70, Withdrawal from the Institution.) Students wishing to cancel their enrollment must do so during the first five days of the semester to avoid further financial obligation. Cancellation of enrollment (withdrawal from the university) is initiated through the Office of Student Affairs. Dropping all courses constitutes withdrawal from the university.

Classification of Students

Undergraduate students who have completed less than 30 semester credits are classified as freshmen, 30-59 1/2 semester credits as sophomores, 60-89 1/2 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.

**Numbering System of Courses**

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

**Upper-division:**
- Courses numbered 300-399 inclusive are normally taken by juniors and seniors.
- 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:**
- 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. 73).
- 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 prereq of Pre-calculus (Math 107), meaning that the student may not enroll for Calculus until successfully completing Math 107. Prereqs may also be general as “one semester of chemistry or concurrent enrollment” (see Bio S 103; concurrent enrollment is indicated by the symbol c/ /). Prereqs 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 prereq based on demonstrated competence or equivalent academic experience.

**Certification of a Major**

An undergraduate may certify an academic major upon completion of 30 semester hours with the approval of the Director of the Curriculum Advisory Program and the appropriate department head.

A student who has completed 60 semester hours must certify a major as a condition to further enrollment. The student initiates the certification procedure in the Curriculum Advisory Program office, acquires the signatures of the academic adviser and the department chair, and returns the signed documents to the CAP office. Certified majors who wish to transfer to another academic major do so by requesting, from the Registrar's
Office, a "Change of Major" card, and obtaining the approval and signature of the department heads of the former major and the new major.

Students who satisfy the minimum university requirements plus any departmental core requirements with a 2.0 cumulative g.p.a. are qualified for certification except in those departments which are impacted or must meet special certification standards. Consult the departmental section of this catalog for specific department requirements.

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 ensure 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, education, engineering, fine arts, 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.

Departments and programs designated as "impacted" or those units directed to raise certification standards by external or certifying agencies may require more than the minimum 30 hours for certification and a g.p.a. higher than the minimum 2.0. Academic units may also require completion of one or more specific 100- or 200-level core courses prior to certification. Units must include in their certification requirements a mechanism whereby qualified transfer students can be certified upon admission. These requirements for immediate certification may include standards more rigorous than the minimum requirements, but prior enrollment per se at WSU cannot be a condition for certification of transfer students.

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 and Catalog Supplement.

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 Faculty Senate. (Courses approved for S, F grading are footnoted in the Time Schedule.) A, S, 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. 52). 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 to the department chair's office 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 through Continuing Education and Public Service courses sponsored by Washington State University yield grade points toward graduation. Correspondence or 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 permanent home mailing address at the end of the fall and spring semesters. Only one grade report is produced per student. Students requesting an additional grade report must order a copy of their official transcript.

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 $3 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

Courses completed with a grade of C or above may not be repeated for credit or grade points.

Students may repeat courses in which they have received a grade of C- or below only if there is space available in the course. If a student repeats a course in which an I (incomplete) grade was received, the incomplete grade will be changed to F.

When a student repeats a course and earns another grade, the series of repeats and grades will be retained on the student’s official record. However, the last grade only shall be calculated in the cumulative grade point average, and contribute to the total number of hours required for graduation.

In determining scholarship for graduation honors, the first grade only shall be used. It is the student’s responsibility to indicate repeat courses on the registration form. Repeats by correspondence, extension, or in residence at other institutions must be reported orally or in writing to the Registrar’s Office. If a student transfers a course to
WSU from another institution, and subsequently repeats the course at WSU, only the credit and grade points earned at WSU will be allowed.

Courses Approved for Repeat Credit

Some courses have been approved for repeat credit, i.e., the student may enroll in the same course during a subsequent semester and additional credit and grade point will be accumulated. An example of such a course would be a Special Topics where the course content may vary from semester to semester. Courses approved for additional credit, with maximum credit allowable, if any, will be indicated in the catalog, e.g., “May be repeated for credit; cumulative maximum 6 hours.”

Pass-Fail Grading Options

Pass-fail options are available for undergraduate and graduate students. Specific characteristics of the two options are listed below. During registration, students indicate on the Registration Form that they wish to enroll in the course on a pass-fail basis. The adviser’s approval and signature are required for undergraduates. 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 for S, F grading (rule 90f) are excluded from the pass-fail option. Courses approved for S, F grading are footnoted in the Time Schedule.

A student 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.

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. Students in the College of Veterinary Medicine with adviser approval may enroll for a total of six courses in the professional 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: Class 5 (except those working on a second baccalaureate degree) and Class 6 (graduate) students are eligible 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. 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. (NOTE: effective with the graduating class of summer 1987, the minimum cumulative g.p.a. required to graduate cum laude will be 3.50). 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 Executive 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.

Decertification

Once certified, a student cannot be decertified by the department unless the student becomes academically deficient under General University Academic Regulations 37, 38, or 39. Students decertified under these rules must meet the approved additional criteria for recertification, if any.
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 Executive 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.

The university reserves the right to verify dates of attendance and degrees and honors awarded.

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 bachelor’s degree, depending upon the field of study.

Application for a bachelor’s or DVM degree should be made at the Registrar’s Office near the end of the junior year and at least 80 days prior to the expected graduation date. A graduation application must be on file in the Registrar’s Office before a student can graduate. A graduation fee must be paid at the time of application.
Candidates must present a minimum of 120 semester hours of credit for graduation including a minimum of 40 semester hours of credit in upper-division courses for a four-year degree. 500-level courses will count toward the upper-division requirements, but an undergraduate may not be required to enroll in or complete a 500-level course as a requirement for a baccalaureate degree.

A student desiring a second bachelor's degree shall satisfy the second degree program requirements 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 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 that 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 Faculty 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.

Statement of Institutional Responsibility

As a general rule, undergraduate students who are certified majors or graduate degree candidates can assume that a degree will be granted if they maintain continuous enrollment and meet all requirements as listed in Academic Regulations 114-118. However, because of serious reductions in financial support, loss of faculty, or for other significant reasons, the university may from time to time find it necessary to discontinue a degree program. When this occurs, further admission into the degree program will be frozen effective with the official action dropping the degree, and every effort will be made to allow currently enrolled majors and graduate degree candidates to complete their degrees within a reasonable period of time. To facilitate this process, department
and program chairs (or the appropriate dean) have the obligation to provide for the individual needs of these students: e.g., (1) students may be encouraged to complete their requirements in similar or related degree tracks; (2) although General University Requirements (GURs) and the minimum total hours for the degree may never be waived, the student's major department may waive or substitute departmental degree requirements (approval of the Graduate School required for graduate students); (3) undergraduate students may be allowed to complete remaining requirements at another institution under Academic Regulation 114(a)5. Graduate students may be allowed to take courses or conduct research at another institution when approved by the student's graduate committee and the Graduate School. In all cases, all financial obligations are the responsibility of the individual student involved, except as otherwise noted in the WSU Bulletin or the Graduate Studies Bulletin.

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, Sciences, and Social Sciences. 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>Intercultural Studies [I], [G], [K]—3 hours¹</td>
</tr>
<tr>
<td>Arts and Humanities [G], [H]—6 hours</td>
</tr>
<tr>
<td>Social Sciences [S], [K], [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>
</tbody>
</table>

No designated GUR course can be taken on a pass-fail basis.

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.

¹effective with the entering freshman class of fall 1985.
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 and 6 hours in Social Sciences. 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 and 3 hours in the Physical Sciences 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

H

ARTS AND HUMANITIES

Anthropology 201, 355
Architecture 120, 121, 202
Asia 310[G]
Asian American Studies 311[G]
Communications 101
Drama 160, 365, 366
Fine Arts 101, 201, 202
Foreign Languages 310[G]
French 333, 334
German 334
Russian 317[G]
History 101, 102, 340, 341, 342, 343, 360
Humanities 100, 101, 198, 202, 204, 310[G], 335
Interior Design 202
Landscape Architecture 202
Music 160, 265[G], 362, 364
Native American Studies 101[G], 265[G]
Philosophy 101, 107, 198, 201, 220, 300, 305, 310

S

SOCIAL SCIENCES

Agricultural Economics 201, 320
Anthropology 101, 198, 203, 303, 304, 309[K], 330
Asia 270[K], 275[K]
Asian American Studies 201[K], 203, 275[K]
### Academic Regulations

<table>
<thead>
<tr>
<th>Department</th>
<th>Course Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Studies</td>
<td>101</td>
</tr>
<tr>
<td>Chicano Studies</td>
<td>110 [K]</td>
</tr>
<tr>
<td>Economics</td>
<td>102, 198, 201, 203</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>101 [U], 303 [U]</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>270 [K]</td>
</tr>
<tr>
<td>Forestry</td>
<td>303 [U]</td>
</tr>
<tr>
<td>History</td>
<td>110, 111, 198, 201 [K], 230, 231, 270 [K], 275 [K], 298, 320, 381, 382</td>
</tr>
<tr>
<td>Political Science</td>
<td>101, 102, 198, 222, 333</td>
</tr>
<tr>
<td>Psychology</td>
<td>101, 102, 198, 350, 355</td>
</tr>
<tr>
<td>Sociology</td>
<td>101, 102, 198, 331, 350, 355</td>
</tr>
<tr>
<td>Women Studies</td>
<td>200, 298</td>
</tr>
</tbody>
</table>

## I  INTERCULTURAL STUDIES

<table>
<thead>
<tr>
<th>Department</th>
<th>Course Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>309 [K], 327, 331</td>
</tr>
<tr>
<td>Asia Program</td>
<td>270 [K], 275 [K], 310 [G], 314, 315</td>
</tr>
<tr>
<td>Asian American Studies</td>
<td>201 [K], 275 [K], 311 [G], 315</td>
</tr>
<tr>
<td>Chicano Studies</td>
<td>110 [K]</td>
</tr>
<tr>
<td>English</td>
<td>311 [G]</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>270 [K], 310 [G]</td>
</tr>
<tr>
<td>History</td>
<td>201 [K], 270 [K], 275 [K], 331, 374</td>
</tr>
<tr>
<td>Humanities</td>
<td>310 [G]</td>
</tr>
<tr>
<td>Music</td>
<td>265 [G]</td>
</tr>
<tr>
<td>Native American Studies</td>
<td>101 [G], 265 [G], 327, 331</td>
</tr>
<tr>
<td>Philosophy</td>
<td>314, 315</td>
</tr>
<tr>
<td>Russian</td>
<td>317 [G]</td>
</tr>
</tbody>
</table>

## C  COMMUNICATION PROFICIENCY

<table>
<thead>
<tr>
<th>Department</th>
<th>Course Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/Home</td>
<td>205</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>300</td>
</tr>
<tr>
<td>Philosophy</td>
<td>102</td>
</tr>
<tr>
<td>Speech Communication</td>
<td>102, 235, 302, 330</td>
</tr>
</tbody>
</table>

## W  WRITTEN COMMUNICATION PROFICIENCY

<table>
<thead>
<tr>
<th>Department</th>
<th>Course Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>101, 105, 198, 201, 301, 402</td>
</tr>
</tbody>
</table>

## B  BIOLOGICAL SCIENCES

<table>
<thead>
<tr>
<th>Department</th>
<th>Course Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging</td>
<td>130</td>
</tr>
<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>120 (L)</td>
</tr>
<tr>
<td>Food Science/Human Nutrition</td>
<td>130</td>
</tr>
<tr>
<td>Genetics</td>
<td>201</td>
</tr>
<tr>
<td>Zoology</td>
<td>205, 330</td>
</tr>
</tbody>
</table>
PHYSICAL SCIENCES

Astronomy 135
Chemistry 101 (L), 102 (L), 105 (L), 106, 115 (L), 116, 117 (L), 298 (L)
Geology 101 (L), 102 (L), 310 (L)
Physics 101 (L), 201 (L), 380

SCIENCES

Environmental Science 101 [U], 303 [U]
Forestry 303 [U]
Mathematics 103, 105, 116, 140, 171, 198, 202, 206

(L) Course includes laboratory work.
[G] Course meets GUR in either intercultural studies or humanities.
[K] Course meets GUR in either intercultural studies or social sciences.
[U] Course meets GUR in either sciences or social sciences.
Colleges, Graduate School and 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. Programs in agriculture prepare students for a wide variety of careers. They include careers in food processing, manufacturing, pest management, finance, and sale and distribution of farm products. They also include farming, ranching, teaching, forest management, and many types of government work. Students who want to teach can become vocational agriculture teachers, extension workers, communications workers in newspaper, magazine, radio or television journalism, or business educators. Scientific careers await in research, college teaching, and in highly technical pursuits in industry and government. A farm background is not required for any of these careers.

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. Students are 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 and Home Economics, Plant Pathology</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Economics, Agricultural Engineering, Agronomy, Animal Sciences, Entomology, Environmental Science, Food Science and Human Nutrition, Forest Management, Horticulture, Landscape Architecture, Range Management, Soils, Wildlife and Wildland Recreation Management</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 and Home Economics</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, Plant Physiology, 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, Plant Physiology, Soils</td>
</tr>
</tbody>
</table>

1 Administered by the College of Engineering and Architecture
2 Administered by the College of Sciences and Arts

# Majors

In Agriculture, the student has a choice of 19 undergraduate majors, six with separate curricula, and a choice of a minor in many of the departments.

<table>
<thead>
<tr>
<th>Major</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Communications</td>
<td>General Agriculture and Home Economics</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 Education</td>
<td>General Agriculture and Home Economics</td>
</tr>
<tr>
<td>Agricultural Engineering¹</td>
<td>College of Engineering and Architecture</td>
</tr>
<tr>
<td>Agricultural Mechanization</td>
<td>Agricultural Engineering</td>
</tr>
</tbody>
</table>
Agronomy
Separate curricula in technical, business and industry, and science

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
Separate curriculum in Wildland Recreation Management

General Agriculture

Horticulture
Separate curricula in fruit and vegetable production, ornamental horticulture

Integrated Pest Management

Landscape Architecture

Plant Pathology

Plant Physiology

Range Management

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

Entomology

Colleges of Agriculture and Home Economics, Engineering and Architecture, and Sciences and Arts

Food Science and Human Nutrition

Forestry and Range Management

General Agriculture and Home Economics

Horticulture and Landscape Architecture

General Agriculture and Home Economics

Horticulture and Landscape Architecture

Plant Pathology

Colleges of Agriculture and Home Economics, and Sciences and Arts

Forestry and Range Management

Agronomy and Soils

Agronomy and Soils

Animal Sciences

Degree and administration by College of Engineering and Architecture

Accredited by Society of American Foresters

Accredited by the American Society of Landscape Architects

<table>
<thead>
<tr>
<th>Home Economics Degrees</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts</td>
<td>Child and Family Studies, Clothing and Textiles,</td>
</tr>
<tr>
<td></td>
<td>Interior Design¹</td>
</tr>
<tr>
<td>Bachelor of Science in Home Economics</td>
<td>Food Science and Human Nutrition,² General Agriculture</td>
</tr>
<tr>
<td></td>
<td>and Home Economics</td>
</tr>
<tr>
<td>Master of Arts in Child and Family Studies</td>
<td>Child and Family Studies</td>
</tr>
</tbody>
</table>
The Colleges

<table>
<thead>
<tr>
<th>Master of Arts in Home Economics</th>
<th>Clothing, Interior Design and Textiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Food Science</td>
<td>Food Science and Human Nutrition, Nutrition</td>
</tr>
<tr>
<td>Master of Science in Home Economics</td>
<td>Food Science and Human Nutrition</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Food Science and Human Nutrition, Nutrition</td>
</tr>
</tbody>
</table>

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

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>Major</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child and Family Studies</td>
<td>Child and Family Studies</td>
</tr>
<tr>
<td>options in child development, consumer studies, family studies, housing, preschool education</td>
<td></td>
</tr>
<tr>
<td>Clothing and Textiles</td>
<td>Clothing, Interior Design, and Textiles</td>
</tr>
<tr>
<td>option in merchandising</td>
<td></td>
</tr>
<tr>
<td>Home Economics Education</td>
<td>General Agriculture and Home Economics</td>
</tr>
<tr>
<td>Human Nutrition and Foods</td>
<td>Food Science and Human Nutrition</td>
</tr>
<tr>
<td>options in dietetics, food related business, food related communication, food service management, research</td>
<td></td>
</tr>
<tr>
<td>Interior Design</td>
<td>Clothing, Interior Design, and Textiles</td>
</tr>
</tbody>
</table>

College of Business and Economics

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, Finance and Marketing, and Management and Systems, offer the following major specializations:

- Accounting
- Finance
- General Business
- Human Resources/Personnel
- Information Systems
- Insurance
- International Business
- Management
- Marketing
- Quantitative Methods
- Real Estate

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 meet 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 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>Business Administration, Economics</td>
</tr>
</tbody>
</table>

College of Education

M. Stephen Lilly, Dean

The College of Education consists of the Departments of Education, Physical Education, Sport and Leisure Studies, Vocational Technical Education, and programs in Adult and Continuing Education and Industrial Technology.

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 also provides professional training in physical education, recreation, industrial education, athletic training, counseling, vocational technical education, and adult and continuing education. It 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. The college holds that people of courage, idealism, and intellectual promise, nurtured in the elements of disciplined liberal education and 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. Practical experiences are integrated with course work throughout professional preparation curricula.

The mission of the certification programs in the College of Education is to furnish intensive preparation for persons who serve or aspire to serve in teaching, supervisory, special services, or administrative fields at all levels of education, as well as in related areas of professional services. Candidates for certification must demonstrate knowledge and competencies at qualified levels of professional practice.

Graduate programs in the College of Education offer advanced course work, field experience, and research preparation for leadership personnel in education. Some certification programs are available at the graduate level. Doctoral programs focus on preparation of administrative personnel for the schools, counselors, teacher educators, and educational researchers. Graduate programs stress scholarship as a basis for all professional endeavors.

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, the University Council on Education Administration, and the American Educational Research Association. State education agencies 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 schools and communities in the state of Washington. Applied 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>Physical Education, Sport and Leisure Studies</td>
</tr>
<tr>
<td>Master of Adult and Continuing Education</td>
<td>Education</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Physical Education, Sport and Leisure Studies, 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, Sport and Leisure Studies</td>
</tr>
</tbody>
</table>
College of Engineering and Architecture

Reid C. Miller, Dean

The College of Engineering and Architecture has responsibilities for instruction, research, and public service 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. Research 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, and technical publications. To perform these varied functions, the College of Engineering and Architecture is organized into several degree-granting departments and research units. The faculty of the college participates 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, geological 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 and Architecture must include 15 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 and Architecture, 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 and Architecture 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 in the state of Washington.

The Doctor of Philosophy

The College of Engineering and Architecture offers programs of study and research in Engineering Science, Civil and Environmental Engineering, Chemical Engineering, Electrical and Computer Engineering, and Mechanical Engineering leading to the degree of Doctor of Philosophy. Admission is open to qualified students with a recognized degree in engineering, mathematics, a physical science, or a biological science.

Students wishing to specialize in agricultural engineering, atmospheric research, and materials science may do so through the Doctor of Philosophy in Engineering Science.

Additional information with regard to specific areas of active research may be obtained by contacting the Associate Dean for Research or the appropriate department chair.

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

Degrees

The curricula offered by the various departments of the College of Engineering and Architecture 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 Engi-</td>
</tr>
<tr>
<td></td>
<td>neering, Civil Engineering, Construction Management, Electrical</td>
</tr>
<tr>
<td></td>
<td>Engineering, Geological Engineering, Materials Science and Engi-</td>
</tr>
<tr>
<td></td>
<td>neering, Mechanical Engineering</td>
</tr>
<tr>
<td>Bachelor of Architecture</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Architecture, Chemical Engineering, Civil Engineering, Electrical</td>
</tr>
<tr>
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<td>Engineering, Engineering, Environmental Engineering, Geological</td>
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<td>Engineering, Materials Science and Engineering, Mechanical En-</td>
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<td>Doctor of Philosophy</td>
<td>Engineering Science, Civil and Environmental Engineering, Chemi-</td>
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<td>cal Engineering, Electrical and Computer Engineering, Mechanical</td>
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<td>Engineering</td>
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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 in an intimate professional relationship with the members of the Graduate Faculty who have been selected because of their special competence and interest.

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, business administration, chemical engineering, chemical physics, chemistry, civil engineering, computer science, economics, education, electrical and computer engineering, engineering science, English, entomology, food science, genetics and cell biology, geology, history, hor-
griculture, individual interdisciplinary studies, literary studies, mathematics, mechanical engineering, nutrition, pharmacology and toxicology, physical education, physics, plant pathology, plant physiology, 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 individual 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 degree of Master of Fine Arts, Master of Business Administration, Master of Accounting, Master of Adult and Continuing Education, Master of Nursing, 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 accepted 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 sub-
stituted for residence requirements. For necessary interpretations, inquires 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 se-
mers.

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 Education**

Credit earned in graduate-level courses taken through the WSU Office of Continuing Education
and Public Service 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; 2. Part-time enrollment; 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 $15.00 per calendar year. Graduate leave status enrollees
who wish to enroll for credit must give the Graduate School one month notice prior to the en-
rollment 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 Examina-
tion (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.

**Registration Policy for Graduate Students Completing Degree Requirements**

Graduate students must register for the required amount of 700, 702, or 800 during the se-
mester or summer session in which they take their final exam. Fall and spring semesters and
summer session officially end at the time final grades are due in the Registrar's Office. Exam-
inations are not normally scheduled between regular terms. However, students who have received permission from the Graduate School to schedule final master’s or doctoral oral examinations in the interim nonclass period after the end of a term will be required to register for the following semester or summer session.

**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 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 Gradu-
that meet General University Requirements for Graduation and the additional requirements of
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 com-
mitment 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, civil engineering, computer science, education, electrical engineering, and
materials science and engineering. The Department of Energy Hanford Laboratories are avail-
able for research purposes by individual arrangement and provide an exceptional opportunity
to do research requiring facilities not available at most institutions of higher learning. Gradu-
ate 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 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 de-
partment chair and the sponsoring program coordinator prior to being presented to the Gradu-
ate 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.
Southwest Washington Joint Center for Education
Lynn Degerstedt, Director

The Southwest Washington Joint Center for Education in Vancouver offers programs from three Washington institutions. Washington State University provides graduate level and professional continuing education programs in engineering. Clark College offers two-year training programs for technicians, and pre-engineering and other transfer programs in technical areas. Clark College also cooperates with WSU in offering continuing education for area engineers, technicians, and managers. The Evergreen State College provides upper-division supporting course work and continuing education programs in community studies, health and human services, and management and the public interest.

WSU courses offered at the SWJCE in Vancouver are designed to accommodate the working professional who wishes to pursue an advanced degree or take graduate courses on a part-time basis. Programs leading to a Master of Science degree are available in four areas of specialization: Electrical Engineering, Materials Science and Engineering, Engineering (management option), and Mechanical Engineering.

Admission
Persons interested in earning a Master’s degree in Engineering are encouraged to make application to the WSU Graduate School. For more information about both graduate programs and professional continuing education, please contact:
Dr. Ed Howard, Graduate Program Coordinator or
Ms. Kay DeMooey, Continuing Education Program Coordinator
Southwest Washington Joint Center for Education
1800 E. McLoughlin Boulevard
Vancouver, WA 98663
(206) 699-0420

Intercollegiate Center for Nursing Education
Thelma L. Cleveland, Dean

The Intercollegiate Center for Nursing Education (ICNE) is a school of nursing shared in common by three institutions of higher education: Eastern Washington University, Washington State University, and Whitworth College. As such, the center reflects both the singular and the common purposes of its sponsoring institutions and serves as a model of collaborative educational endeavors. The nature of the consortium encourages an environment supportive of individual differences in students, faculty, and institutional emphases; broadens the resources available to the school of nursing; and provides a diversity of student backgrounds and experiences which stimulate and enhance learning. Through interinstitutional agreement, and consonant with its sense of evolving societal needs, the center focuses on improving the health care of the region, the nation, and the world community by preparing nurses through instructional programs, generating knowledge through research, and providing services in response to community needs.

Instructional programs are conducted at the baccalaureate and master's degree levels to develop responsible citizens and to provide the professional knowledge, skills, and values essential to the practice of nursing within the state and in the larger society. The undergraduate curriculum includes both liberal arts education and preparation as a generalist in the practice of nursing. The curriculum at the graduate level provides preparation for advanced and specialized practice and affords experience in conducting research. Faculty members, as an integral
The Colleges

part of the instructional process, practice nursing and serve as models and mentors with small
groups of students. The ICNE provides an environment conducive to intellectual curiosity and
independent learning. Its programs of study accommodate individual differences and interests.

Instruction, research, and public service are interrelated aspects of the ICNE’s mission.
The primary emphasis of the center is focused on its instructional programs. However, research
enriches instructional and public service activities through the dissemination of current know-
ledge. Instruction and public service guide the ICNE in addressing needed areas of research.
Public service activities also strengthen the instructional function of the ICNE.

Undergraduate Program

ICNE’s undergraduate program is approved by the Washington State Board of Nursing and is
accredited by the National League for Nursing. Approximately 375 generic and registered
nurse students are enrolled in the baccalaureate nursing program at Spokane and the outreach
site in Yakima, Washington.

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. Graduates practice in a variety of settings including
hospitals, community health agencies, nursing homes, clinics, occupational health programs,
home health care, and community mental health centers.

The curriculum in nursing consists of lower- and upper-division components and is four aca-
demic 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 recom-
dended 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 Education and Public Service. Stu-
dents are selectively admitted into the upper-division nursing major twice a year in Spokane.
They are admitted once a year, fall term, in Yakima. 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 Univer-
sity between December 1 and February 15 preceding the fall term or May 1 and September 1
preceding the spring term in which the applicant plans to enroll.

Admission

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.
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
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 February 15 (for fall) or September 1 (for spring) 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. 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 May 1 and September 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 (for fall) or January 1 (for spring).

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 99164-3524.

**Graduate Program**

Established in 1983, the Master of Nursing program offers majors in Nursing Service Administration and Nursing Education. Clinical content in adult health and illness serves as core knowledge for both majors. Degree requirements, which include a thesis, can be completed in two years of full-time study. Individualized programs can be arranged to facilitate part-time study.

**School Nurse Certification Program**

The Eastern Washington School Nurse Certification Program is implemented through the ICNE. Applicants for the program must have a Bachelor of Science degree in Nursing. Details of this program are listed in the departmental section of this catalog under Nursing.

**Continuing Education Program**

The Continuing Education Program provides a variety of offerings for Registered Nurses throughout eastern Washington. In addition to workshops, conferences, seminars, and courses conducted at more than eleven sites, televised courses are aired over cable and public television systems. The continuing education needs and interests of nurses are assessed through a variety of means.

**Degrees**

The degrees offered by the Intercollegiate Center for Nursing Education are as follows:

<table>
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<th>Degree</th>
<th>Area</th>
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<tbody>
<tr>
<td>Bachelor of Science in Nursing</td>
<td>Generalized practice of professional nursing</td>
</tr>
<tr>
<td>Master of Nursing</td>
<td>Nursing Education, Nursing Service Administra-</td>
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<td>tion</td>
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</table>
College of Pharmacy
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.

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<tr>
<th>WSU Courses</th>
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<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 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 will then 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 Department of Computer Science is a member of the national Computer Science Network (CSNET). The Geological Engineering curriculum is accredited by the Accreditation Board for Engineering and Technology. The graduate training program in clinical psychology is accredited by the American Psychological Association. The Speech Pathology program is accredited by the State Board of Education, and by the American Speech-Language-Hearing Association,
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 Faculty 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 parentheses.

3 number following course title indicates the hours of credit.

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

c// concurrent enrollment.

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


(a/y) course is offered alternate years only.

(SS) course is offered during summer session only.

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**Adult and Continuing Education**

*Professor and Chair, R. E. Young; Professors, J. H. Cooper, D. E. Hanna, T. F. Trail, R. J. Young; Associate Professors, R. M. Jimmerson, J. S. Long, G. R. Maring.*

The Master of Adult and Continuing Education (M.A.C.Ed) degree is administered jointly by the College of Education and the College of Agriculture and Home Economics; it draws upon faculty from both colleges. M.A.C.Ed. is an interdisciplinary professional degree which utilizes resources and courses in the social sciences, natural sciences, home economics, agriculture, and education.

The ACE program is designed to prepare students for professional careers in the U.S. and abroad in (1) teaching adults, (2) administering and evaluating continuing education programs, and (3) conducting research.

Acceptance by the WSU Graduate School and three letters of recommendation supporting the applicant’s academic qualifications are required for entrance. The M.A.C.Ed. degree candidate successfully completes a minimum of 30 semester hours of graduate credit, 26 of which are from graded courses, and a thesis or special problem. Twelve to fourteen of the graded hours are selected from "core" courses and are required of all students; the remainder of the courses are selected in consultation with an adviser to meet the student’s professional goals. Optional, non-graded internships may be arranged.

M.A.C.Ed. graduates are employed by community colleges and universities; local, state, and federal agencies; private business and industry; and international development organizations. They work as trainers, administrators, coordinators, and specialists in such areas as adult basic education, community education, education, communications, agricultural extension, family living, community development, 4-H, and other human resource development programs in the U.S. and overseas.
Department of Aerospace Studies

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 Methods in Adult and Continuing Education 3 Methods and techniques of teaching in nonformal settings.

516 Research Methods in Adult Education 3 Rationalistic and naturalistic methods of research and design for 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.

530 Farming Systems Research and Development 3 Systematic theoretical framework for farming systems research and development projects using case studies.

535 Microcomputers for the Adult Educator 3 For experienced adult educators who are familiar with microcomputer users. Philosophical implication, educational software, formal and informal instructional planning and evaluation. (SS)

540 Farming Systems and the Family 3 Impacts of farming systems development on the farm family.

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.

Department of Aerospace Studies

Professor and Department Head, Colonel G. L. Thompson; Assistant Professors, Captain D. Antonelli, Captain D. Thorvik, Captain D. Tutt, Captain T. J. Whittacre.

The Department of Aerospace Studies (Air Force ROTC) offers eligible students education and training which leads to a commission as a second lieutenant in the U.S. Air Force. Air Force ROTC students may major in any degree program offered at Washington State University; they supplement their major curriculum with the specialized Aerospace Studies courses in order to prepare for active commissioned service.

Students may participate in either the four-year program or two-year program. The four-year student completes the General Military Course (two years), four-week summer training (Aero 291), and the Professional Officer Course (two years). The two-year student attends a special six-week summer field training (Aero 292) and then completes the Professional Officer Course. The two-year program is designed for any student having two years left in the university, but who has no previous AFROTC or military service.

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.

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 doctrine 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 military education, experience in leadership and management at an active Air Force installation. (SS)

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. (SS)

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 officership 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.

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

Program in Aging

D. A. Dillman, Acting Chair.

The Program in Aging offers an interdisciplinary 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, FSHN/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 [B] Nutrition for Man 3 Same as FSHN 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 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 degrees 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.

320 (301) [S] American Agriculture and Rural Life 3 History and economic structure of American agriculture, land settlement, organizational nature of firms, technology, and patterns in rural life.

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 (Ag Ec ID361).

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.
Mathematics for Economists 3 Same as Math 408.

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.

Applied Operations Research Techniques in Agricultural Economics 3 Prereq Math 201, 202; one statistics course. Quantitative methods used by agricultural economists; linear programming; transportation models.

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

Public Administration and Program Management in Developing Countries 3 Principles and procedures for direction and management of public sector activities in developing countries; case studies. (SS)

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.

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.

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.

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.

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.

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

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

Agribusiness Internship V 1-4 May be repeated for credit. By interview only. Off-campus work-study in the agribusiness industry. (SS)

Seminar I May be repeated for credit. For seniors. Current problems.

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

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.


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

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.

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

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.

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

Advanced Agricultural Production Economics 3 Prereq Ag Ec 408, 540. Current risk decision theory and duality
in production economics theory applied to agricultural policy and managerial problems. (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 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 Current 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 agribusiness firms. 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

9 hours from Ag Ec 340, 350, 360, 440, 450, 460, six of which must be in the same sequence; 3 hours from Ag Ec 410, 411, 430; 3 hours from 400-level; 6 hours from 300-level or above

Ag Ec 335 or B Law 210
QMeth 215, Biom 310, or Biom 412
QMeth or Cpt S elective, or Ag Ec 410, 411
Acctg 230, 231
Junior-level accounting or Cpt S 150 and 151, 152, 153, or 154
Econ 102, 203, 301, and 320 or 340
Engl 101 and 402
SpCom 102, 235, 302, 330 or 331
Communications Proficiency elective
Hum and Soc S (one from Mgt 301, Psych 306, 307 and 3 hours of 200-level or above) *
Bio S and Ph S electives (include 1 hour credit for lab) **
Math 201 and 202
Ag elective, excluding Ag Ec

Total hours specified 99
Other electives 21

* 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

Ag Ec: 9 hours from 340, 350, 360, 440, 450, 460, six of which must be in the same sequence: 410 or 411; 6 hours 300 or above electives; 6 hours 400-level electives 24
QMeth 215, Biom 310, or Biom 412 3-4
QMeth or Cpt S elective or Ag Ec 410, 411 2-3
Accrg 230 3
Econ 102, 203, 301, 320 or 340, 401 or 402 15
Ag Electives, excluding Ag Ec 12
Engl 101 and 402 6
SpCom 102, 235, 302, 330, or 331 3
Communications Proficiency elective 3
Hum and Soc S (9 hours must be 200-level or above)* 15
Bio S and Ph S (include 1 hour credit for lab) ** 7
Math 201 and 202 6

Total hours specified 99
Other electives 21

*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>Requirement</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>SpCom 102, 235, 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 (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, or 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, J. E. George, R. E. Hermanson, A. E. Powell, H. Waeldtl; Associate Professors, D. L. Bassett, D. C. Davis, G. M. Hyde, L. G. James, D. K. McCool, K. E. Saxton, J. B. Simpson, D. E. Wilkins; Assistant Professors, R. P. Cavaleri, R. G. Evans, T. W. Ley, M. J. Pitts, 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 become 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 engineering 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 meaningful reality.

354 Agricultural Engineering Analysis 3 (2-3) Prereq Cpt S 203. Analysis of physical and biological systems by digital computer methods.

361 Principles of Farm Machinery 3 (2-3) Prereq C E 212. Operating principles, functional components, and related motion, force, and power requirements.

380 Farm Electrification Engineering 3 (2-3) Electric power and electronics in agriculture; a.c. power, power distribution, electrical wiring, motors, controls, and instrumentation.

385 Principles of Environmental Control 3 Prereq Ag E 354, 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 Engineering 3 (2-3) Prereq C E 315; Soils 201. Fundamentals of soil and water engineering; agricultural hydrology and hydraulics, erosion control, and water quality. Field trip required.

451 Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Prereq junior or senior. Readings and interviews, research, and oral presentation of professional subjects.

455 Agricultural Engineering Design I 1 (0-3) Prereq senior in Engr. Determination of background information for design; selection and evaluation of design concepts.

456 Agricultural Engineering Design II 3 (1-6) Prereq Ag E 455. Continuation of Ag E 455. Detailed design of an agricultural engineering-related process, machine, structure, or system.

462 Internal Combustion Engines 3 (2-3) Prereq M E 301; C E 212. Theory and design; compression ratio, fuel, speed, load, engine performance; hitching, weight transfer, tractor stability, traction.

471 Farm Structures Design 3 Prereq C E 314. Engineering analysis and practice applied to concrete foundations and structural design in wood and steel for farm buildings.

482 Microcomputer Controls in Agriculture 3 (2-3) Prereq Cpt S 203; Ag E 380. Microcomputer-based control systems with agricultural applications. Credit not granted for both Ag E 482 and 582.

487 Food Process Engineering 3 Prereq Ag E 385 or FSHN 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 354, 390. Theory and design of gravity, sprinkler, and trickle irrigation systems; water requirements and sources; efficient 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; cumulative maximum 6 hours. Not open to freshmen. Prior approval of supervisor and adviser required. Work experience related to academic learning.
Conservation Engineering 3 (2-3) Prereq Ag E 354, 390. Predicting occurrence and disposition of water on agricultural watersheds; hydrologic modeling; erosion processes; control structures and methods; construction practices. Credit not granted for both Ag E 496 and 596.

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

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.

Natural Channel Flow 3 (2-3) Prereq C E 451. Fluid mechanics of non-uniform flow in irregular channels; unsteady flow, flow routing, sediment transport and density currents. Cooperative course taught at the University of Idaho (AgE ID555).


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 on 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.

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.

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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Ag E 110 Intro Ag E</td>
<td>1</td>
</tr>
<tr>
<td>Engl 101 Composition (GUR)</td>
<td>3</td>
</tr>
<tr>
<td>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Chem 105 Prin of Chemistry</td>
<td>4</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Ag E 154 Creative Engr</td>
<td>1</td>
</tr>
<tr>
<td>Arts and Hum Elective (GUR)</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201 Classical Physics</td>
<td>4</td>
</tr>
<tr>
<td>Math 172 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>Math 220 Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>Soc S Elective (GUR)</td>
<td>3</td>
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#### Sophomore Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cpt S 203 Cpt Prog for Engrs</td>
<td>2</td>
</tr>
<tr>
<td>C E 211 Statics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 202 Classical Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

93
Bio S 103 or Bio S Elective 4
Math 273 Calculus III 2

Second Semester
Econ 201 Contemp Econ (GUR) 4
Math 315 Diff Equations 3
C E 212 Dynamics 3
Ag E 354 Ag Engr Analysis 3
C E 101 Intro to Surveying 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 380 Farm Elec Engr 3
Ag E 361 Prin of Farm Mach 3
Ag E 390 Soil & Water Engr 3
E E 214 Design Analog & Dig 3
Ag E 471 Farm Struct Design 3
Ag E 455 Seminar 1

Senior Year
First Semester
Ag E 455 Ag Engr Design I 1
C E 463 Engr Admin 3
Ag E Elective 3
Elective 3
Communication Elect (GUR) 3
Arts and Hum Elective (GUR) 3

Second Semester
Ag E 456 Ag Engr Design II 3
Soc S or Arts & Hum (GUR) 3
Ag E Elective 3
Engr Design Elective 3
Engr or Sci Elective 3

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 students to own, operate, and manage their 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 recognized 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.

211 Agricultural Machinery 3 (2-3) Principles, materials of construction, care, capacity of tillage, planting, spraying, harvesting, and materials handling machinery.

310 (210) Agricultural Mechanization Analysis 3 (2-3) Prereq Cpt S 153. Microcomputer applications in agricultural mechanization; word processing, operational cost analysis, equipment and irrigation scheduling, and record keeping.

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/1. The repair, adjustment, protective maintenance, operation, and safety of the small gasoline engine.

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/1. 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.

421 Agricultural Building Design 3 Prereq Ag M 203. Loading, analysis, and design of structural components of agricultural buildings; foundations, frames, and connections.

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 FSHN 423.

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>4</td>
</tr>
<tr>
<td>Chem 101 Intro Chem</td>
<td>3</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 205 Ag Bldg Const</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 Chemistry Related to Man</td>
<td>4</td>
</tr>
<tr>
<td>Math 108 Precalculus Trig</td>
<td>2</td>
</tr>
<tr>
<td>Arts and Hum Elective</td>
<td>3</td>
</tr>
<tr>
<td>Com Prof Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cpt S 150 Comp Prog</td>
<td>2</td>
</tr>
<tr>
<td>Chem 240 or Phys 101</td>
<td>4</td>
</tr>
<tr>
<td>Cpt S 153 Basic Prog</td>
<td>2</td>
</tr>
<tr>
<td>Bio S 103 Intro Biol</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>Accctg 230 Principles of Accct</td>
<td>3</td>
</tr>
<tr>
<td>Bio S 104 or Bot 201</td>
<td>4</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

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Ag M 421 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>Ag M 310 Ag M Analysis</td>
<td>3</td>
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</tbody>
</table>

### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</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>Hum Elective</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 335 or B Law 210</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
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</tbody>
</table>

### Senior Year

<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>
<tr>
<td>Ag Ec 350, 360 or Mktg 360</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>4</td>
</tr>
</tbody>
</table>

### Department of Agronomy and Soils


The Department of Agronomy and Soils offers courses of study in two major fields—agronomy and soils. (See Soils section.) Students interested in this general area may register for either major and elect courses in the other. Curricula and options are available in various special areas in both agronomy and soils.

An interdisciplinary curriculum in integrated pest management is available to those students whose interests span the areas of agronomy and pest management. The curriculum is described under the General Agriculture section of this bulletin.

Students are encouraged to participate as part-time employees in agronomic or soils research programs and as professional interns with agricultural industries. Departmental scholarships are available based on ability, need, and interest. Students gain professional and social contacts with faculty and other students through the Agronomy and Soils Club.

Agronomists examine metabolic and developmental processes of crop plants, develop improved crop varieties through plant breeding and genetic engineering technology, study alternative crop production and management practices which conserve natural resources while enhancing crop yields, and investigate the impact of agricultural production on agricultural and nonagricultural ecosystems. Turf management opportunities include golf courses and playfields. Graduates qualify for careers in agribusiness, corporate and technical farm management, and research, sales, and service positions. Positions are available in government and commercial agencies such as Agricultural Research and Extension, 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 international agricultural development.

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".

Agron

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

201 Crop Growth and Development 4 (2-6) Prereq Bio S 103 or Agron 101 or c/c. Principles and techniques related to growth, development, and culture of crop plants.

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; Agron 201. Adaptation, production, and utilization of cereals, grain legumes, and oilseed crops. Field trip required.

304 Cereal Products 2 Same as FSHN 304.

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

405 Seed Conditioning 1 (0-3) Prereq Agron 201 or 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 120; 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. Literature review; preparation and presentation of reports in crop science.

445 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. (a/y) Joint course taught with the University of Idaho (PISc ID 469).

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

498 Professional Internship V 1-3 May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

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

504 Advanced Plant Breeding 4 Prereq Agron 445. Genetic, cytogenic, 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. (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.

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

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. (a/y) Cooperative course taught at the University of Idaho (PISc ID 538).

569 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. (a/y) Cooperative course
taught at the University of Idaho (PISC ID569).

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 hours of the total required for Agronomy must be in upper-division courses. Core and option requirements cannot be taken pass/fail.

CORE REQUIREMENTS

The core courses are common to all Agronomy majors and include General University Requirements and supporting courses. The two departmental undergraduate curricula offer flexibility in courses and selection of electives that best suit the individual student's needs and interests. The student must consult an adviser.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Agron 101, 201, 305, 445, 411, 412, 498, and 499</td>
</tr>
<tr>
<td>3</td>
<td>Bot 320</td>
</tr>
<tr>
<td>4</td>
<td>GenCB 301</td>
</tr>
<tr>
<td>3</td>
<td>Soils 201</td>
</tr>
<tr>
<td>3</td>
<td>Pl P 329</td>
</tr>
<tr>
<td>3</td>
<td>Entom 340 or 433</td>
</tr>
<tr>
<td>12</td>
<td>Chem 105, 106, 107 (or 101, 102), and 240</td>
</tr>
<tr>
<td>3</td>
<td>Math Elective (101, 107, 140, 171)</td>
</tr>
<tr>
<td>3</td>
<td>Biom Elective (310, 412)</td>
</tr>
<tr>
<td>6</td>
<td>Com Prof Electives (Enrl 101 and Ag 205 or Spe)</td>
</tr>
<tr>
<td>8</td>
<td>Bio S 103, 104 or Bot 120</td>
</tr>
<tr>
<td>6</td>
<td>Hum Electives</td>
</tr>
<tr>
<td>6</td>
<td>Soc S Electives (inc Econ or Ag Ec 201)</td>
</tr>
<tr>
<td>1-4</td>
<td>Computer Science Elective</td>
</tr>
</tbody>
</table>

In addition to core courses students must select either the technical or science curriculum.

Agronomy elective courses include: Agron 301, 302, 303, 405, 410, 445, 469, 498, and 499. A maximum of 3 credits of 498 can be used to satisfy Agronomy electives.

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. Various options offer specialization in interest areas. Students in this curriculum must complete one of the listed options.

Production and Management Option. For students who wish to engage in farming or corporate farm management and field agronomy positions.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Agron 410</td>
</tr>
<tr>
<td>10</td>
<td>Agron Electives</td>
</tr>
<tr>
<td>3</td>
<td>Ag Ec 340</td>
</tr>
<tr>
<td>6</td>
<td>Soils 301, 422, 441</td>
</tr>
<tr>
<td>3</td>
<td>Ag M 344</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course Options</th>
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<tbody>
<tr>
<td>5</td>
<td>Agron Electives</td>
</tr>
<tr>
<td>4-5</td>
<td>Bact 101 or 201</td>
</tr>
<tr>
<td>3-4</td>
<td>Bio S 372, Soils 431, or Hort 417</td>
</tr>
<tr>
<td>2-3</td>
<td>Pl P 405, Entom 450, IPM 452</td>
</tr>
<tr>
<td>6</td>
<td>Soils 301, 427, 441</td>
</tr>
<tr>
<td>3</td>
<td>Ag M 344</td>
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</tbody>
</table>

Turf Management Option. For students who wish to specialize in golf course supervision and similar recreation positions involving agronomic management techniques and personnel relations.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Agron 301, 302, 499</td>
</tr>
<tr>
<td>3</td>
<td>L A 264 or Hort 231</td>
</tr>
<tr>
<td>1</td>
<td>Ag M 346</td>
</tr>
<tr>
<td>3</td>
<td>Mgmt Electives or RLS 288</td>
</tr>
<tr>
<td>3</td>
<td>Pl P 405, Entom 450, Hort 417, Entom 480</td>
</tr>
<tr>
<td>6</td>
<td>Soils 361, 422, 441</td>
</tr>
<tr>
<td>4</td>
<td>Ag M 312, 313</td>
</tr>
<tr>
<td>3</td>
<td>Ag M 344</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Agron Electives</td>
</tr>
<tr>
<td>4</td>
<td>Geol 101 or 102</td>
</tr>
<tr>
<td>5-6</td>
<td>Soils 421, 474, 411, 413</td>
</tr>
<tr>
<td>6</td>
<td>Soils 301, 422, 441</td>
</tr>
<tr>
<td>3</td>
<td>Ag M 344</td>
</tr>
</tbody>
</table>

98
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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron Electives</td>
<td>5</td>
</tr>
<tr>
<td>Chem 212 or 220</td>
<td>8</td>
</tr>
<tr>
<td>BC/BP 364, 366 or 563, 564</td>
<td>4-8</td>
</tr>
<tr>
<td>Math 171 or 140</td>
<td>3</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Bect 101 or 201</td>
<td>4-5</td>
</tr>
<tr>
<td>BC/BP 417, Bio S 305 or Bot 332</td>
<td>2-4</td>
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<tr>
<td>FSHN 482</td>
<td>4</td>
</tr>
<tr>
<td>Biom 412</td>
<td>3</td>
</tr>
</tbody>
</table>

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

Director, J. Burbick.

The undergraduate program in American Studies offers an interdisciplinary sequence of courses that enables the student to study and interpret American culture. The aim is integrative, investigating American society, political institutions, literature, and art. The contribution of minority groups to America and the expressions of mass and popular culture are also included. Basically, the program promotes an understanding 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 communication and government service.

Degree Requirements

The program consists of a core curriculum of 30 hours (with some options available within the core) plus an additional 9 hour area of concentration which permits students to investigate particular aspects of American culture. Courses in the core and areas of concentration may also be used to satisfy General University Requirements, where applicable. The American Studies Program also offers a minor.

Core Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hist 110, 111 American History</td>
<td>6</td>
</tr>
<tr>
<td>Engl 243, 246 American Literature</td>
<td>6</td>
</tr>
<tr>
<td>Engl/Hist 216 American Culture</td>
<td>3</td>
</tr>
<tr>
<td>Engl 470 American Culture Series</td>
<td>3</td>
</tr>
<tr>
<td>American literature (upper-division)</td>
<td>3</td>
</tr>
<tr>
<td>American history (upper-division)</td>
<td>3</td>
</tr>
<tr>
<td>Two courses (6 hours) taken in two</td>
<td></td>
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<tr>
<td>different departments, from:</td>
<td></td>
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<tr>
<td>Phil 436 American Philosophy</td>
<td></td>
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<tr>
<td>Pol S 300, 318, 427, 434, 455</td>
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<tr>
<td>Soc 331, 342, 351</td>
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<tr>
<td>SpCom 425 History and Criticism of</td>
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<tr>
<td>Public Address</td>
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<tr>
<td>F A 304 American Art</td>
<td></td>
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</tbody>
</table>

Areas of Concentration

Prescribed courses have been established in the following departments to satisfy the 9-hour requirement for an area of concentration:

1. Comparative American Cultures:
   - Asian American Studies
   - Black Studies
   - Chicano Studies
   - Native American Studies
2. History
3. Literature
4. Political Science
5. Sociology

Also, it is the intention of the American Studies faculty that certain students, with the approval of their advisers, be permitted to investigate areas not officially approved in the foregoing list, by designing their own programs and taking courses that will aid in their research. Thus, certain students may wish to investigate the effects of agriculture, engineering, environmental science, science, the graphic arts, theatre, or mass communications, to name only several possibilities, on American culture.
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 a bachelor's degree in English or History. Students with degrees in other humanities or social sciences areas may be accepted. Students interested in the Ph.D. degree program must have the M.A. 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, extension, or veterinary medicine.

Core courses are required for all majors in the department. Prior to their junior year students select one of eleven options to further their interests. 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 specializations 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 specifically 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 Introductory Animal Science 3 (2-3)
Types and breeds of livestock, terminology, methods, management systems, techniques of animal and poultry production and consumer impact.

164 Poultry Management Laboratory 1 (0-3) Management practices associated with hatchery, broiler, and laying hen enterprises. Special clothing required.

166 Horse Management Laboratory 1 (0-3) Handling of horses and management practices associated with a horse enterprise.

172 Dairy Cattle Management Laboratory 1 (0-3) Management practices associated with a dairy enterprise.

174 Beef Cow-Calf Management Laboratory 1 (0-3) Management practices associated with a beef cow-calf enterprise for students without experience.

176 Sheep Management Laboratory 1 (0-3) Management practices associated with a farm flock sheep enterprise.

178 Swine Management Laboratory 1 (0-3)
Management practices associated with a swine enterprise. Field trip and special clothing required.

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

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

272 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 104; Chem 102 or 106; Chem 240 or c/1. 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 Genetics of Farm Animals 3 (2-3) Prereq GenCB 301; Biom 310 or 412. Genetic principles applied to breeding of farm animals.

350 Reproduction of Farm Animals 3 Prereq Bio S 104 and Chem 102 or 106. Anatomy and physiology of reproductive organs; hormones of reproduction; production of gametes; artificial insemination; fertilization; prenatal development; fertility and infertility.

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


378 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 Seminar 1 May be repeated for credit. For juniors.

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 formulation and mixing.

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

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 Physiology of Domestic Animals 3 Prereq V An 308. Basic animal functions; relationship and difference between domestic animals; measurement of functional processes.

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

444 Environmental Aspects of Animal Management 3 (2-3) Prereq A S 301 and 440. Relations of the thermal, social, and disease environments to animal function and performance. (a/fv)

452 Physiology of Lactation 3 Prereq A S 350. Anatomy, physiology, and endocrine control of mammary gland development and milk secretory process.

453 Physiology of Lactation Laboratory 1 (0-3) Prereq A S 452 or c/1. Laboratory and field techniques in lactation physiology; mammary gland anatomy and development, immunology, hormones, milk composition, antibiotics, mastitis.

454 Artificial Insemination and Pregnancy Detection 2 (0-6) Prereq A S 351. Techniques in semen handling, insemination and pregnancy detection in cattle.

### Department of Animal Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>466</td>
<td>Horse Production 3 (2-3) Prereq  A S 313, 330, 350. Principles of breeding, feeding, and management of horses.</td>
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<tr>
<td>476</td>
<td>Sheep Science 3 (2-3) Prereq A S 313, 330, 350. Breeding, feeding, management, and marketing of commercial and purebred sheep; wool studies. Cooperative course taught at the University of Idaho (AnSc ID322).</td>
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<tr>
<td>478</td>
<td>Swine Production 3 (2-3) Prereq A S 313, 330, 350. Principles of breeding, feeding, management, and marketing of swine. Field trips and special clothing required. Joint listing with the University of Idaho (AnSc ID 326).</td>
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<tr>
<td>499</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
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<tr>
<td>500</td>
<td>Seminar in Nutrition 1 May be repeated for credit.</td>
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<tr>
<td>505</td>
<td>Experimental Nutrition 3 (1-6) Prereq Chem 220, 222; BC/BP 364. Laboratory techniques used in nutritional research; modern biochemical methods of analysis; introduction to physiological chemistry.</td>
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<tr>
<td>510</td>
<td>Rumen Microbiology 3 (2-3) Prereq A S 410; 3 hrs microbiology. Identify and characterize bacteria and protozoa and their metabolism in the rumen of domestic and wild herbivores. (a/y)</td>
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<tr>
<td>512</td>
<td>Vitamins 2 Prereq A S 404 or 410; BC/BP 364. Role of vitamins in the nutrition of animals; emphasis on fat soluble vitamins. (a/y)</td>
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<tr>
<td>514</td>
<td>Energy Metabolism 3 Prereq A S 404 or 410; BC/BP 364. Biochemical, physiological, and nutritional aspects of energy metabolism. (a/y)</td>
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<tr>
<td>516</td>
<td>Protein and Amino Acid Metabolism 2 Prereq A S 404 or 410; BC/BP 364. Biochemical, physiological, and nutritional aspects of protein and amino acid metabolism. (a/y)</td>
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<tr>
<td>518</td>
<td>Mineral Metabolism 3 Prereq A S 404 or 410; BC/BP 364. Dietary levels, absorption, excretion, metabolism, and interactions of minerals. (a/y)</td>
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<tr>
<td>528</td>
<td>Topics in Animal Breeding 2 May be repeated for credit; cumulative maximum 4 hours. Graduate level counterpart of A S 428; additional requirements. Credit not granted for both A S 428 and 528.</td>
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<tr>
<td>530</td>
<td>Analysis and Interpretation of Animal Experiments 2 Prereq A S 330. Analysis and interpretation of animal experiments and the use of computers in processing data; discussion of student's research problems.</td>
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<tr>
<td>540</td>
<td>Seminar in Animal Physiology 1 May be repeated for credit. Current developments in animal physiology. Joint listing with the University of Idaho (AnSc ID520).</td>
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<tr>
<td>548</td>
<td>Endocrine Physiology 3 Prereq BC/BP 364. Physiology and chemistry of endocrine systems and mechanisms of action of hormones on organs and cellular processes in mammals.</td>
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<tr>
<td>549</td>
<td>Endocrine Physiology Laboratory 1 (0-3) Prereq BC/BP 364; A S 548 or c/f. Modern techniques in endocrinology; immunoassays; receptor assays; hormone measurement and hormone effects in animals.</td>
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<tr>
<td>550</td>
<td>Advanced Reproduction 4 (3-3) Prereq A S 350. Physiology of sexual maturation; gametogenesis; sexual cycle; fertilization; embryonic development; physiological, chemical, and immunological characterization of hormones of reproduction. (a/y)</td>
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<tr>
<td>598</td>
<td>Advanced Topics in Animal Sciences V 1-2 May be repeated for credit. Recent research in various disciplines of animal sciences.</td>
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<tr>
<td>600</td>
<td>Special Projects or Independent Study Variable credit.</td>
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<tr>
<td>700</td>
<td>Master's Research, Thesis, and/or Examination Variable credit.</td>
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<tr>
<td>800</td>
<td>Doctoral Research, Dissertation, and/or Examination Variable credit.</td>
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</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 Code</th>
<th>Core Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>Arts and Hum Elective</td>
<td>6</td>
</tr>
<tr>
<td>201/203</td>
<td>Ag Ec 201 or Econ 203</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>101/402</td>
<td>Engl 101 and 201 or 402</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>AgHE 205 or SpCom 102</td>
<td>3</td>
</tr>
</tbody>
</table>
Math 107 or 201 3
Bio S 103 and 104 8
Chem 101 and 102 or 105, 106 and 107 8.9
Chem 240 4
Biom 310 or 412 3
GenCB 301 4
V An 308 3
A S 101, 301, 313, 330, 350, 351, 380, 440 and 441 21

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; Age Ec 340; Age Ec 335 or B Law 210; Age Ec 430 or Acctg 230; Agron 302.

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

**Dairy cattle:** A S 172, 272, 410, 452, 472; Age Ec 340; Age Ec 335 or B Law 210; Age Ec 430 or Acctg 230; Agron 302; FSHN 305; VMS 251.

**Horses:** A S 166, 260, 266, 404, 466; Age Ec 340; Age Ec 335 or B Law 210; Age Ec 430 or Acctg 230; Agron 302; Age M 203; VMS 261.

**Swine:** A S 178, 260, 360, 404, 478; Age Ec 340; Age Ec 335 or B Law 210; Age Ec 430 or Acctg 230; Age M 203; VMS 261.

**Poultry:** A S 164, 404, 464; one of A S 260, 360, FSHN 102 or 305; Age Ec 340; Age Ec 335 or B Law 210; Age Ec 430 or Acctg 230; VMS 261.

**Meat:** A S 260, 360, 378; one of A S 464, 466, 472, 474, 476 or 478; Bact 101 or 201; FSHN 480, 481; 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, FSHN 101 or 305; Chem 105, 106, 107; BC/BP 364; Math 202; Cpt S 150 and 151 or 154; Biom 412; Age Ec 411; GenCB 402.

**Animal biology:** One of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, FSHN 102 or 305; an additional 3 hrs of A S 164, 166, 172, 174, 176, 178, 266, 464, 466, 472, 474, 476 or 478; one of Age Ec 335, 430, B Law 210 or Acctg 230; Bact 201; BC/BP 364; Phys 101, 102; Chem 105, 106, 107.

**Nutrition:** A S 404, 410; one of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, FSHN 102 or 305; Chem 105, 106, 107, 220, 222; Chem 340, 341, 342, 343 in lieu of Chem 240; Math 202; 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, FSHN 102 or 305; Chem 105, 106, 107, 220, 222; BC/BP 364; two of Zool 315, 320, 352, 353, Bact 201, 310 or 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.

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**Department of Anthropology**

**Associate Professor and Department Head,** G. L. Gamble; **Professors,** R. E. Ackerman, J. H. Bodley, P. A. Hassan, W. D. Lipe, R. A. Littlewood, P. J. Mebringer, J. Sheppard, W. Willard; **Professors Emeriti,** R. D. Daugherty, T. A. Gorski; **Associate Professors,** M. S. Fleisher, C. E. Gustafson, G. S. Krantz, D. A. Messerschmidt; **Assistant Professors,** T. A. Kohler, L. S. Stone.

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 consult-
ing firms. In addition, anthropology provides a strong option for a liberal arts education.

Courses within anthropology 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. Additional collections maintained by the department are also available for study. The anthropology museum has both permanent and travelling exhibits with a particular focus in North American prehistory. 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 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 4-8 Prereq permission by application. Practice in methods of archaeological, ethnological, or linguistic field research. (SS)

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

320 Native Peoples of North America 3 Culture areas of North America; comparison of representative aboriginal cultures. Joint listing with the University of Idaho (Anthr ID425).

327 [I] Contemporary Native Peoples of the Americas 3 Contemporary cultures of Native American communities in South America, Meso America, and North America.

329 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. [II] 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 Classical Archaeology 3 Classical Mediterranean civilizations: effects on Western art, architecture, social processes. Speech, Thought and Culture 3 The role of language in social situations and
as a reflection of cultural differences.


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

370 Microcomputers in Anthropology 3 (2-3) Use of microcomputers for statistical description and exploratory analysis of anthropological data.

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.

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

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.

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 or 330 or 331. Archaeological theory in anthropological perspective; current trends in method and theory in American archaeology. Credit not granted for both Anth 430 and 530.

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.

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

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

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.

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.

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.

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.

526 Native Peoples of Middle and South America 3 Graduate level counterpart of Anth 426; additional requirements.

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 436; additional requirements. Credit not granted for both Anth 436 and 536.

537 Quantitative Methods in Anthropology 4 (3-3) May be repeated for credit; cumulative maximum 8 hours. Prereq undergraduate stat course. Sampling, data analysis, inferential statistics, microcomputer and mainframe use applied to anthropological problems with emphasis on archaeology.

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 the 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 interior Northwest.

545 Historical Archaeology 3 Excavation and analysis of historical archaeological sites; acculturational implications. Cooperative course taught at the University of Idaho (Anth ID531).

549 Lithic Technology 3 Prereq Anth 512. Basic concepts involved in the interpretation of lithic artifacts via replicative systems analysis.

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


552 Seminar in Syntax 3 Prereq Anth 450.
Current theories and methods in the
analysis of the syntactic component of
natural language.

553 Sociocultural Linguistics 3 The role of
language in culture, cognition and so-
ciety.

554 Seminar in Anthropological Methods 3
Prereq Anth 450, 510. Elicitation, re-
cording techniques and analysis of so-
ciocultural, and linguistic field data;
field work and seminar orientation.

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

557 Seminar in Language Structure 3 May
be repeated for credit; cumulative max-
imum 9 hours. Linguistic study of struc-
tures of selected languages or lan-
guage groups.

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

561 Current Trends in Physical Anthropo-
logy 3 May be repeated for credit. Pre-
req Anth 461, 465. Intensive review of
major current trends in physical anthro-
ponology.

563 Human Races 3 Graduate level coun-
terpart of Anth 463; additional re-
quirements. Credit not granted for both
Anth 463 and 563.

565 Evolution of Man 3 Graduate level coun-
terpart of Anth 465; additional re-
quirements. Credit not granted for both
Anth 465 and 565.

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

569 Seminar in Physical Anthropology 3
May be repeated for credit; cumulative
maximum 6 hours. Prereq Anth 260.
Investigation of selected areas of re-
search in modern physical anthropol-
yogy.

570 Sediments and Quaternary Environ-
ments 4 (3-3) Sediment-forming pro-
cesses, sedimentological techniques, re-
construction of quaternary environ-
ments, and paleoecological analysis of
archaeological sediments. Field trip re-
quired.

571 Archaeological and Quaternary Stratig-
raphy 4 (3-3) Prereq Anth 570. Strat-
igraphic classification, field procedures,
presentation of data, stratigraphy and
quaternary environments; the quater-
ary record, and case studies of ar-
chaeological sites. Field trip required.

573 Identification of Faunal Remains 4
(2-6) The relevance of faunal remains
in archaeological context; excavating,
preserving, and identifying bones com-
monly encountered in archaeological
sites. Field trip required.

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

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

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

580 Paleoecology 3 Past environments,
stressing the interrelations of physical
and biological factors. Cooperative
course taught at the University of
Idaho (Geol ID 515).

591 Special Topics in Anthropology 3 May
be repeated for credit; cumulative max-
imum 9 hours. Examination of cur-
cent areas of anthropological theory
and research.

592 Special Topics in Anthropology 3 May
be repeated for credit; cumulative max-
imum 9 hours. Examination of cur-
cent areas of anthropological theory
and research.

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 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

107
of 30 hours in anthropology. A student minor-
ing in anthropology is required to take a mini-
imum 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;
(d) Anth 250, 350, 355, 450, 456;
(e) Anth 101 or 198, 201, 301, 303, 304,
309, 401, 402, 403.

 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

Professor and Chair, J. W. Rudd; Professors,
R. B. Allen, T. J. Barruska, C. R. Burger, R. J.
Patton, D. M. Scott, S. W. Williams; Associate
Professors, J. A. Berg, K. L. Carper, L. G.
Fisher, D. R. Heil, H. C. Matthews, D. W.
Menzies, D. N. Mirkovich, S. M. Reckn; As-
sistant Professors, C. R. Chew, W. W. C. Graham,
M. S. Owen, M. R. Samizay, C. W. Silk, K. C.
Singh.

The Department of Architecture offers courses
of study leading to three baccalaureate degrees.
These are Bachelor of Architecture, Bachelor
of Science in Construction Management, and
Bachelor of Science in Architectural Studies.
Starting in the fall semester of 1985, the
Department of Architecture will offer a course
of study leading to a Master of Science in
Architecture which will emphasize energy and
resource management as related to architecture.

Architects are trained to perform profession-
ally in a wide range of design and construc-
tion 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 pos-
sess a high level of intuitive, analytical, and
technical skills combined with a deep under-
standing 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 construc-
tion 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 man-
agement 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 as-
sure this breadth of understanding.

The department is a member of the Asso-
ciation of Collegiate Schools of Architecture
and the Associated Schools of Construction.
Student chapters of the American Institute of
Architects and the Associated General Con-
tractors provide a professional link with their
professional counterparts. The professional
Bachelor of Architecture degree program is
accredited by the National Architectural Ac-
crediting Board.

Description of Courses

For explanation see Index under "Symbols"

Architecture

101 Graphic Communication I 3 (1-6)
Drawing to perceive three-dimensional
space; freehand (architectural) draw-
ing, drafting, isometric and ortho-
graphic 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 tech-
niques; exposure to other perspective
drawing and presentation methods.

120 [H] Architectural History I 3 Development
from prehistory to the Gothic
Cathedral; influences of society, cli-
mate, materials on buildings from
simple shelters to monumental archi-
tecture.

121 [H] Architectural History II 3 Develop-
ment of American architecture; cave
dwellings, native American progress,
colonial styles to contemporary archi-
tecture; effects of European styles upon
America.

201 Introductory Design I 3 (0-6) Prereq
Arch 101, 102. Two- and three-dimen-
sional basic designs as visual and
structural phenomena.

202 [H] The Built Environment 3 Planning
and design of the built environment;
products, interiors, structures, landscapes, cities; factors and process affecting environmental quality.

203 Introductory Design II 3 (0-6) Prereq Arch 201. Determinants of traditional, contemporary, and future space enclosure systems.

301 Architectural Design 4 (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 (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 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.

353 Architectural Structures Lab I 1 (0-2) Prereq Arch 351 or c/-. Design principles of architectural structures systems; available systems for spanning and enclosing architectural space.

354 Architectural Structures Lab II 1 (0-2) Prereq Arch 352 or c/-. Continuation of Arch 353.

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 (0-10) Prereq Arch 403; 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 (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 (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 (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, organization, 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.

Architectural Theory I 2 Prereq Arch 423. Architectural criticism and evaluation as viewed from contemporary and historical precedents.

Architectural Theory II 2 Prereq Arch 423. Theory development and its effect on the design process.

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.

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.

Acoustics 1 Prereq major in Arch or Cst M.; Phys 101, 102; Math 107. Sound theory, control, acoustics, and reinforcement systems as applied to architectural problems.

Energy Use in Buildings 2 Prereq Arch 432. Energy use in contemporary buildings; conservation and alternate energy sources.

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.

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.

Architectural Economics 3 Prereq senior in Arch. Theory and practice of cost benefit analysis applied to architectural systems.

Construction Communications/Costs/Codes 2 Prereq major in Arch. Design and construction delivery systems; codes, costs, specifications, manuals, and contract documents.

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.

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.

Seminar in Architectural Design V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq major in Arch. Advanced study in architectural design.

Seminar in Architectural Communications V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq major in Arch. Advanced study in graphic communication.

Seminar in Architectural History V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq major in Arch. Advanced study in architectural history.

Seminar in Environmental Control V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq major in Arch or Cst M. Advanced study in environmental control of buildings.

Seminar in Urban and Regional Planning V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Arch 342. Advanced study in urban and regional planning.

Seminar in Construction Management V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq senior in Cst M. Advanced study in construction practice management.

Seminar in Computer Applications V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Cpt S 151, 153, 154, or 203. Architectural and construction applications of computer graphics, management, computer-aided design.

Seminar in Professional Practice V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq senior in Arch. Advanced study in architectural practice management.

Seminar in Architectural Structures V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Arch 301, 351 or c/f. Advanced study in architectural structures systems.
499 Special Problems V 1-4 May be repeated for credit.
520 Directed Topics in Architecture V 1-3 May be repeated for credit; cumulative maximum 6 hours. Energy and resource management; design, environmental controls, materials, construction systems, and life cycle costs.
540 History and Theory of Energy and Resource Management in Architecture 3 Interrelationship between energy resources, technology, and related human and societal needs with architecture and the built environment.
570 Advanced Architectural Laboratory 6 (0-12) Human, societal, environmental, and the technological factors relevant to energy and resource issues in architectural design.
600 Special Projects or Independent Study Variable credit.
700 Master’s Research, Thesis, and/or Examination. Variable credit.

Description of Courses

For explanation, see Index under “Symbols”

Construction Management

Cst M
451 Construction Practice Management I 3 Prereq senior in Cst M. Construction industry organization and ethics; contract documents, their relationships, meanings, and significance in construction.
453 Construction Document Analysis Lab 1 (0-3) Prereq Cst M 451 or c//. Plans and specification reading; analysis and interpretation of construction documents.
454 Construction Project Management Lab 1 (0-3) Prereq Cst M 452 or c//. Construction project management; techniques and rationale for project planning, organizing, directing, and controlling.
455 Critical Path Management Techniques 1 Prereq senior in Cst M or Arch. Architectural and construction applications for network programming and scheduling techniques.
470 Construction Estimating 3 Prereq senior in Cst M. Cost estimating related to building general construction work;

methods and techniques applicable to quantity survey and detailed estimates.

Seminar in Construction Management V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq senior in Cst M. Advanced study in construction practice management.

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. For Architecture, selection is based on the satisfaction of minimum requirements, overall grade point, and demonstrated abilities. For Construction Management, selection is based on satisfaction of minimum requirements and overall grade point.

Prospective applicants for certification are responsible for acquainting themselves with all requirements and procedures.

Schedule of Studies

BACHELOR OF ARCHITECTURE

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
First Semester
Math 107 and/or 108
Com Prof GUR

Hours
2-5
3
Arch 101 Graphic Communication 3
Hum GUR 3
Env S 101 (Soc S GUR) 3

**Second Semester**
Mach 171 or 206 4-3
Arch 102 Graphic Communication 3
Com Prof GUR 3
Arch 202 Built Environment 3
Elective 3

**Sophomore Year**

**First Semester**
Phys 201 or 101 4
Arch 201 Intro Design 3
Arch 331 Mat and Const 3
Soc S GUR 3
Electives 3

**Second Semester**
Ph S Elective 3-4
Arch 203 Intro Design II 3
Hum GUR 3
Electives 6

**Professional Program**
Upon completion of the Pre-Architecture program or their equivalent, students must make application 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 February 1 preceding fall registration. Transfer students must also submit an Application for Admission to the university. Successful applicants will be notified prior to May 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 351 Structures I 3
Arch 353 Struct Sem 1
Elective 3

**Second Semester**
Arch 303 Design 4
Arch 309 Determinants 2
Arch 324 History 2
Arch 352 Structures II 3
Arch 354 Struct Sem 1
Arch 432 Env Control Bldgs 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 1-2
Arch Emphasis Elective 3-4
F A Elective 3

**Fifth Year**

**First Semester**
Arch 411 Design 6
Arch 415 Programming 2
Arch 472 Const Comm 2
Arch Emphasis Elective 3
Elective 2-3

**Second Semester**
Arch 413 Design 6
Arch 473 Business 2
Arch Emphasis Elective 4
F A Elective 3

**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.

Pre-Construction Management

Freshman Year
First Semester
Math 107
Math 108
Arch 101 Graphic Comm I
Humanities GUR
Phys 101 General

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Second Semester
Com Prof GUR
Math 206 Math Arch
Econ 102 Economics
Humanities GUR
Phys 102 General

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Sophomore Year
First Semester
Acctg 230 Accounting
Econ 203 Economics
Cst S 150, 153
Com Prof GUR

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Certification Requirements
1. Satisfactory completion of a minimum of 43 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
3. Must submit the "Academic Record" form and other required data. Form and instructions for application are available from the Office of Admissions and must be submitted prior to December 15 preceding spring registration. Transfer students must also submit an Application for Admission to the university. Successful applicants will be notified prior to the beginning of spring semester.

Construction Management
Second Semester
Acctg 231 Accounting
B Law 210 Bus Law
Arch 331 Mat and Const I
C E 101 Surveying
Arch 495 Const Mgmt Seminar
Elective

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Junior Year
First Semester
Arch 351 Structures
Ins 320 Insurance
Arch 434 Acoustics
Arch 332 Mat and Const II
R E 305 Real Estate
Cst S 405 Computer Systems

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Second Semester
Arch 352 Structures
Arch 432 Env Control I
Fin 325 Finance
Cst M 455 CPM in Const
Arch 470 Const Estimating
Elective

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Senior Year
First Semester
Cst M 451 Const Pract Mgmt
Approved Personnel Elective
Arch 433 Env Control II
Arch 472 Const Comm/Costs/Codes

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Asia Program

Cst M 453 Const Doc Analysis Lab
Cst M 495 Const Mgmt Seminar

Second Semester
Cst M 452 Const Pract Mgmt
Approved BA/Econ
Arch 342 Urban Theory
Cst M 395 Const Mgmt Seminar
Cst M 454 Const Proj Mgmt Lab
Elective

Asia Program

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. Tsurutani (Political Science, East Asia), Professor Emeritus, A. H. Smith (Anthropology, East Asia); Associate Professors, D. A. Messerschmidt (Anthropology, South Asia), A. S. Richards (Child & Family Studies, Developing Countries); Assistant Professors, T. Mehta (Nutrition, South Asia), G. Nomura (History, East Asia); L. Stone (Anthropology, South Asia); Librarians, R. Kwun (East Asia), A. M. Spritzer (South Asia).

The Asia Program is designed to provide a broad, systematic knowledge of Asia through interdisciplinary study and is intended to serve four major objectives:
(1) to prepare students 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 governmental 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.

Description of Courses

For explanation see Index under "Symbols"

Asia

270 [K] Introduction to South Asian Culture 3 Same as Hist 270.

275 [K] Introduction to East Asian Culture 3 Same as Hist 275.
303 Elementary Hindi 4 Same as For L 303.
304 Elementary Hindi 4 Same as For L 304.
310 [G] Eastern Civilization and Literature 3 Same as For L 310.
314 [I] Philosophy and Religion of India 3 Same as Phil 314.
315 [I] Philosophy and Religion of China and Japan 3 Same as Phil 315.
329 (429) Peoples of Asia 3 Same as Anth 329.
352 Gandhi and Twentieth Century India 3 Same as For L 352.
435 Politics of Developing Nations 3 Same as Pol S 435.
436 Comparative Politics: China and Japan 3 Same as Pol S 436.
476 Revolutionary China, 1800 to Present 3 Same as Hist 476.
477 Modern Japanese History 3 Same as Hist 477.
499 Special Problems V 1-4 May be repeated for credit.

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 Asia 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, Religious Studies).

MINOR: Students wishing to minor in Asian Studies should see the Program Director for requirements.

East Asia

Anth 323 Peoples of East Asia 3
Asia 275 Intro East Asia 3
Asia 315 Phil of China, Japan 3
Asia 455 Politics SE Asia 3
Asia 456 Politics of China, Japan 3
Asia 476 Revol China 3
Asia 477 Modern Japan 3
Chin 301 Chinese I 4
Chin 302 Chinese II 4
Chin 303 Intensive Chinese 10
Chin 401 Chinese III 4
Japn 301 Japanese I 4
Japn 302 Japanese II 4
Japn 303 Intensive Japn 10
Japn 401 Japanese III 4

114
Program in Astronomy

Description of Courses

For explanation see Index under "Symbols"

AAS: 201 [K] Introduction to Asian American History 3 Historical experience 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 American community development, structures, and issues; compares and contrasts new emerging communities with the old.

275 [K] 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 [G] 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.

312 Hawaii/Pacific American Literature 3 Indigenous and immigrant American literatures, cultures, and histories of Hawaii and the Pacific from 1778 to the present.

315 [I] Philosophy and Religion of China and Japan 3 Same as Phil 315.

410 Ethnic Groups and Public Education 2 or 3 Same as Educ 410.

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.

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; Professors, J. H. Lutz, A. Marcus; Assistant Professor, B. Srinivasan.
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 Cptr S 330; Hist 381; Math 440, 441, 448; Phys 320, 341, 342, 450, 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.

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**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 pre-veterinary 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 chromatid structure, the structure and function of membrane components, control of transcription gene expression, evolution of macromolecules, the biosynthesis and metabolism of waxes, isoprenoids, monoterpenes, and other plant components, the structure and function of plant protease inhibitors, microbial metabolism and its regulation, evolution and function of the enzyme isocitrate 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 synthase, chemoraxis, 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 medi-
cine 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 463 or 464), 2 units of which must include laboratory courses. (BC/BP 463 plus 464 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; 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.

463 General Biochemistry 3 Prereq Chem
220, 222, 342. Open only to juniors and seniors. Protein structure and function; enzyme catalysis; nucleic acid structure and function; biochemical methodology; molecular biology.

464 General Biochemistry 3 Prereq BC/BP
463. Metabolism of carbohydrates, proteins, fats, bioenergetics; photosynthesis; control of metabolic processes.

472 (372) Principles of Biophysical Chemistry 5 Prereq Chem 331. Transport processes; elementary quantum theory; chemical bonding; principles and applications of spectroscopy of macromolecules; statistical mechanics.

482 Biophysical Chemistry Laboratory 2
(0-6) Prereq BC/BP 472 or c/. Laboratory experiments illustrating physical chemical principles 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/BP 563. Mechanisms of action of steroid and peptide hormones; methodology used in hormone research. (a/y)


564 General Biochemistry 3 Prereq BC/BP 563. Carbohydrate, amino acid and lipid metabolism and its control; biochemistry of vitamins; bioenergetics; photosynthesis; dinitrogen fixation.

567 Proteins and Enzymes 3 Prereq BC/BP 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/BP 564. Recent research in selected areas of biochemistry.

569 Nucleic Acid Biochemistry 3 Prereq
BC/BP 563. Chemical and biological properties of DNA and RNA; enzymes acting on nucleic acids and current experimental methods. (a/y)

570 Biomembranes 2 or 3 Prereq BC/BP 563, 564. Structure and function of biological membranes; composition, transport, receptors, and sensory phenomena. (a/y)

573 Physical Biochemistry I 3 Prereq BC/BP 472 or 1 yr physical chem. Techniques for the study of biological structure and function; spectroscopy, magnetic resonance, diffusion, and sedimentation, electron microscopy, diffraction and scattering.

574 Physical Biochemistry II 3 Prereq 1 yr
physical chem; BC/BP 573. Principles relating to biological structure and function, use of physical techniques to examine problems of current interest. (a/y)

575 Molecular Biology Techniques I 1
(0-3) Prereq BC/BP 564 or c/. Modern laboratory techniques in the isolation and characterization of proteins.

576 Molecular Biology Techniques II 1
(0-3) Prereq BC/BP 564 or c/. Modern laboratory technique in the sequencing of nucleic acids.

577 Molecular Biology Techniques III 1
(0-3) Prereq BC/BP 564 or c/. Modern laboratory techniques in the use of plasmids as cloning vehicles.

591 Biochemistry Seminar V 1-2 May be repeated for credit; cumulative maximum 10 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.

Research Proposal 2 May be repeated for credit; cumulative maximum 4 hours. Written and oral presentation of an area of biochemistry.

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

At least 40 of the total hours required for the bachelor's degree in this program 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>Chem 105 Principles&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 107 PreCalculus</td>
<td>3</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tr>
<td>Chem 106 Principles&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3</td>
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<tr>
<td>Chem 107 Qual Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Bio S 104 Introductory</td>
<td>4</td>
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<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Engl 201 Expository Writing&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
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#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>Chem 340 Organic</td>
<td>3</td>
</tr>
<tr>
<td>Chem 341 Organic Lab</td>
<td>2</td>
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<tr>
<td>Chem 220 Quant Analysis</td>
<td>2</td>
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<tr>
<td>Chem 222 Quant Analy Lab</td>
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<tr>
<td>Math 172 Calculus II</td>
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<td>Hum or Soc S Elective</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Chem 342 Organic</td>
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<tr>
<td>Chem 343 Organic Lab</td>
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<tr>
<td>Phys 201 Class Phys</td>
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<tr>
<td>Math 220 Linear Alg</td>
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<tr>
<td>Hum or Soc S Elective</td>
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#### Junior Year

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<tr>
<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>Phys 202 Class Phys</td>
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<tr>
<td>Chem 331 Phys Chem</td>
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<tr>
<td>GenCB 301 General</td>
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<tr>
<th>Foreign Language&lt;sup&gt;3&lt;/sup&gt;</th>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BC/ BP 472 Biophys Ch</td>
<td>3</td>
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<tr>
<td>BC/ BP 482 BP Chem Lab</td>
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</tr>
<tr>
<td>Bio S Elective&lt;sup&gt;4&lt;/sup&gt;</td>
<td>3-4</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
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<tr>
<td>Phys 303 Modern</td>
<td>3</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>BC/ BP 463</td>
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<tr>
<td>Approved Science Elective&lt;sup&gt;4&lt;/sup&gt;</td>
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<tr>
<td>Hum or Soc S Electives</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tr>
<td>BC/ BP 464</td>
<td>3</td>
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<tr>
<td>BC/ BP 499</td>
<td>3</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Chem 398 Undergrad Sem</td>
<td>1</td>
</tr>
<tr>
<td>Approved Science Elective&lt;sup&gt;4&lt;/sup&gt;</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 201 Introduction</td>
<td>2</td>
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</tbody>
</table>

<sup>1</sup>Highly qualified students are encouraged to take Chem 115, 116, and 117. Students who have taken Chem 101 must take Chem 105, 106, 107 or 102, 106, 107.

<sup>2</sup>English 402 may be substituted for English 201 if the student is a junior or senior.

<sup>3</sup>German, French or Russian is recommended but not required.

<sup>4</sup>300-level or higher course that is not otherwise required in the curriculum (except Chem 398) and is approved by the adviser.

Courses printed in Roman type are required for graduation; those in italics are optional.

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**Biometrics**

Professor, T. S. Russell; Associate Professors, J. R. Alldredge, R. B. Bendel, C. T. Gaskins.

Biometrics is statistics applied to biology and agriculture. The purpose of courses in Biometrics is to teach principles of statistics including the analysis and design of experiments and surveys. The 300- and 400-level courses present the basic principles of statistics whereas the 500-level courses present advanced applied statistical concepts which are used in fields where experimentation and data analysis are common. The 500-level courses may be used also in fulfilling requirements for a minor in the statistics program.
Description of Courses

For explanation see Index under "Symbols"

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.

430 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.

512 Analysis of Variance and Experimental Design 3 Prereq Biom 412 or Stat 360. Principles of design with analysis and interpretation of data.

530 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.

Program in Black Studies

Associate Professor, T. Anderson; Assistant Professor, E. Smith; Instructor, D. Culverson.

The Black Studies Program examines from an interdisciplinary approach the historical, social, and 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 contemporary 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 sciences, and in the arts and humanities. Students majoring in Black Studies and minoring in another area can move professionally into related 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 provide teachers with the background and training 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 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 knowledge of the spoken language.

302 Spoken Swahili II 4 Continuation of Bl St 301. Leads toward fluency in conversational Swahili.

310 Afro-American History I 3 Historical experiences of Blacks in America from 1619 to 1899.

311 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 Historical development of Africa from the era of conquest to colonialism and independence.

319 Black Literature in America 1700-1900 3 Survey of black literature covering the 18th century to early 1900.

320 Black Literature in America, 1900 to Present 3 Same as Engl 320.

324 Black Politics 3 Same as Pol S 324.

325 Women and Minorities in the Economy 3 Same as Econ 325.

370 History of Blacks in the Western U.S. 3 The role and contributions of blacks in the development of the Western United States.

381 Sociology of Black Americans 3 Same as Soc 381.
Department of Botany

410 Ethnic Groups and Public Education 2 or 3 Same as Educ 410.
424 South Africa: From Pre-European Settlement 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 African countries; African education and the modernization process.
498 Seminar 2 May be repeated for credit.
499 Special Problems V 1-4 May be repeated 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>
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<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>
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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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<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>
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</tbody>
</table>

Bl St 498 Seminar 2
Bl St 499 Special Problems 2

Recommended electives for program majors and minors: Bl St 262, 301, 302, 313, 454, Soc 320, 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 design 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, cytotoxonomy, 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
120 [B] (201) Introduction to Botany 4 (3-3) Prereq Bio S 103. A survey of the plant kingdom; structure and function of vascular plants.
320 Introductory Plant Physiology 3 (2-3) Prereq Bio S 104 or Bot 120; Org Chem. Water relations, mineral nutrition, photosynthesis, respiration, and growth of plants.
329 General Plant Pathology 3 Same as PL P 329.
332 Systematic Botany 4 (2-6) Prereq Bio S 101 or 103. Identification and classification of seed plants represented in local flora.
405 Principles of Organic Evolution 2 Same as Zool 405.
410 Microtechnique 4 (2-6) By interview only. Modern methods for preparation of biological specimens for microscopy; paraffin and resin embedding, microtomy, anatomical, cytological and histochemical techniques. Credit not granted for both Bot 410 and 510. (a/y)
411 Plant Morphology 4 (3-3) Prereq Bio S 104 or Bot 120. The morphology and phylogeny of the algae, fungi, bryophytes and vascular plants. (a/y)
420 Aquatic Macrophytes 1 Prereq Bot 120, 332. Classification, structure, and habits of predominant aquatic macrophytes of Pacific NW. Field trip required. Credit not granted for both Bot 420 and 520. Cooperative course taught at the University of Idaho (Bot ID420).
421 General Mycology 3 (2-3) Same as PL P 421. (a/y)
426 Morphology of Embryophytes 4 (2-6) Prereq Bot 120. Structure, life history, classification, and phylogeny of liverworts, mosses, clubmosses, horsetails, quillworts, ferns, and gymnosperms. Field trip required. Credit not granted for both Bot 426 and 526. Cooperative course taught at the University of Idaho (Bot ID426).
430 Principles of Plant Systematics 3 Prereq Bot 332. Systematics of vascular plants; description, evolution, classification, nomenclature and current theory. Credit not granted for both Bot 430 and 530. (a/y)
436 Agrostology 3 (1-6) Prereq Bot 332. 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.
451 Plant Anatomy 4 (2-6) Prereq Bot 120. Developmental anatomy and morphology of vascular plants; economic forms. Credit not granted for both Bot 451 and 551.
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.
504 Plant Physiology—Stress Physiology 1 Prereq Bot 320. Temperature, water, and salinity effects on physiological processes; mechanistic understanding of stress.
506 Plant Physiology—Nitrogen Metabolism in Plants 1 Prereq Bot 320; BC/BP 364. Symbiotic nitrogen fixation, uptake, assimilation, translocation, metabolic and physiological roles of nitrogen in plants.
510 Microtechnique 4 (2-6) Graduate level counterpart of Bot 410; additional requirements. Credit not granted for both Bot 410 and 510.
512 Growth and Development 3 Prereq Bot 320. Physiology of growth; metabolism during development and reproduction.
514 Photosynthesis, Photorespiration, and Plant Productivity 3 Prereq Bot 320 or BC/BP 364. Photosynthesis, photores-
piration and the interrelationship of those biochemical, physiological, and environmental factors which determine plant productivity.

516 Experimental Methods in Plant Physiology 3 (2-3) Prereq Bot 320. Advanced techniques and instrumental methods applicable to research in plant physiology. (a/y)

520 Aquatic macrophytes 1 Graduate level counterpart of Bot 420; additional requirements. Credit not granted for both Bot 420 and 520. Cooperative course taught at University of Idaho (Bot ID 520).

526 Morphology of Embryophytes 4 (2-6) Graduate level counterpart of Bot 426; additional requirements. Credit not granted for both Bot 426 and 526. Cooperative course taught at the University of Idaho (Bot ID 526).

530 Principles of Plant Systematics 3 Graduate level counterpart of Bot 430; additional requirements. Credit not granted for Bot 430 and 530. (a/y)

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.

535 Angiosperm Families of the World 3 (2-3) Prereq Bot 332 or 430. Description, classification, and geographic distribution of families of flowering plants of the world. (a/y)

548 Evolutionary Ecology of Populations 3 Same as Zool 548. Graduate level counterpart of Bot 448; additional requirements. Credit not granted for both Bot 448 and 548.

551 Plant Anatomy 4 (2-6) Graduate level counterpart of Bot 451; additional requirements. Credit not granted for both Bot 451 and 551.

556 Phylogeny 4 (3-3) Prereq Bact 201 or Bot 120. 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 V 1-4 May be repeated for credit. Recent research in plant science.

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

Professor and Department Head, G. Johnson; Professors, J. Fortaiés, A. Frakes, J. McConnell, T. Saldin; Associate Professors, R. E. Elfin, J. Truitt; Assistant Professors, R. August, T. Butters, R. Greenberg, M. Jolly, T. Nana-

DEPARTMENT OF FINANCE AND MARKETING

Professor and Department Head, H. Kerr; Professors, I. Field, R. Markin, G. Petry; Associate Professors, T. Anderson, R. Fuller, C. Hsia, J. McCollough, R. Rogowski, D. Stiem;

DEPARTMENT OF MANAGEMENT AND SYSTEMS

Professor and Department Head, C. Morgan; Professor, V. Aggarwal; Associate Professor, R. Singh, M. Wang; Assistant Professors, H. Babari-Kashani, D. Baker, M. Buckley, C. Chen, R. DeFilippi, R. Eder, D. Fedor, D. Randall.

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, marketing, quantitative methods, and real estate. 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, Master of Business Administration, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Special Notice: Enrollment in 300- and 400-level Business courses is open only to juniors and seniors officially certified into degree programs that require these business courses.

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 351. Partnership equities and extended forms of corporate ownerships and entities.

431 Accounting Theory 3 Prereq Acctg 351. Accounting theory and contemporary issues.

433 Accounting Systems 3 Prereq Acctg 330, 338; Cpt S 150 and 153 or 241. Accounting systems design; internal control and computerization.

434 Accounting for Public Organizations 3 Prereq Acctg 351. Conceptual and procedural accounting issues involving public sector organizations.


438 Advanced Cost/Managerial Accounting 3 Prereq Acctg 330, 338; Cpt S 150 and 153 or 241. Information and reporting needs of contemporary management for planning and control of operations.

439 Auditing 3 Prereq Acctg 351, 358, 433; Cpt S 150 and 153 or 241. 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 (3-3) 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 Doctoral Seminar in Accounting 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in accounting.

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.

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.

415 International Business Law 3 Prereq B Law 210. Legal organization of the international community; international aspects of trade and development, economic cooperation, and technical, social, and cultural cooperation.

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.

425 Advanced Financial Management 3 Prereq Fin 325. Advanced topics in financial management; investment; international trade; leases; merger and acquisitions.

426 Cases in Financial Management 3 Prereq Fin 325. Selected cases in finance; current and long-term financing; expansion; pension obligations and capital markets.

427 Investments and Security Analysis 3 Prereq Fin 325. Investment objectives, security analysis, portfolio theory, and efficient market theory.


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 man-
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.

524 Commercial Banking 3 Prereq Fin 502. Analysis of management and policy issues facing commercial banks, thrift institutions, and other financial service firms.


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 Doctoral Seminar in Finance 3 May be repeated for credit; cumulative maximum 9 hours. Prereq Fin 595. Advanced topics in finance.

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.

Insurance

Ins 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.

520 Social Insurance 3 Economic security in our society; problems of death, old age, disability, accidents, illnesses, and unemployment; private and public solutions.

600 Special Projects or Independent Study Variable credit.

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

International Business

I Bus 380 (Mgt 452) International Business 3 Prereq Mgt 301. International political economy; business relationships between nations; corporations and economic institutions.

481 International Finance 3 Prereq Fin 325; I Bus 380. Financial problems of multinational businesses; international financial environment, long-term capital commitment to an international venture, financial techniques for firm operation.

482 International Marketing 3 Prereq Mktg 360; I Bus 380. Opportunities, characteristics, trends in foreign markets; alternative methods; strategies; organizational planning, control; problems of adapting American marketing concepts and methods.

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.

Management

Mgt 201 Introduction to Business Administration 3 Not open to freshmen. For non-majors. Management, marketing, pro-
duction, 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.


350 Business Information Systems 1 Prereq Cpt S 150 and one of Cpt S 151, 153, 154, 241. Information systems development, applications and management in business.

401 Organizational Behavior 3 Prereq Mgt 301. Organizational behavior, motivation, leadership, communications, decision-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, 153, 154, 241; 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.

453 Comparative International Management 3 Comparison of management systems of selected countries.

455 Staffing 3 Prereq Mgt 450. The acquisition, selection, placement, and career management of employees; maximum human resource utilization.

456 Compensation Administration 3 Prereq Mgt 450: Econ 350. Theoretical, research, and applied issues related to the compensation of employees.

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.

483 Macro Organization Behavior 3 Prereq Mgt 301. Design and management of organization structures and processes and the effective linking of subsystems with their environment.

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.

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, 507. 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. 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. To be
taken the final semester of the student's program.

596 Doctoral Seminar in Management 3
   May be repeated for credit; cumulative
   maximum 9 hours. Advanced topics in
   management.

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.

Marketing

Mktg 360 Marketing 3 Prereq Econ 102 or 201;
   Econ 203 or c/u; Acctg 230 or c/u.
   Functions, methods, and middlemen
   used in marketing the principal types
   of goods; price policies, cost of mar-
   keting; government regulation.

367 Consumer Behavior 3 Prereq Mktg 360.
   The investigation of social-psycholog-
   ical phenomena affecting consumer
decision processes; learning theory and
communication.

368 (467) Marketing Research 3 Prereq
   QMeth 215; Mktg 360. Survey and ex-
   perimental methods as they relate to
   marketing research.

460 Marketing Management 3 Prereq Mktg
   360. Use of the case method in the
   analysis of marketing policies; organi-
   zation and control of marketing
   models activities.

461 Product Policy and Pricing 3 Prereq
   QMeth 215; Mktg 360. Design de-
   velopment, introduction of new products,
   managing stable products, optimal
   pricing of products and product lines.

462 Marketing Models and Analysis 3 Prereq
   Cpt S 150 and one of 151, 153,
   154, 241; Math 201; QMeth 215; Mktg
   360. The theory and evaluation of
   marketing models and their signifi-
   cance to the analysis of marketing
   problems.

463 Channel Structure and Systems 3 Prereq
   Mktg 360. Channel choice, cooperation
   and conflict; warehousing, inventory
   control and transportation in physical
   distribution; wholesaling industrial and
   consumer products.

468 Public Policy and Marketing 3 Prereq
   Mktg 360. Productivity and efficiency
   in marketing; government regulation
   of marketing structure and of marketing
   policies and practices; consumer pro-
   tection and welfare.

470 Retail Management 3 Prereq Math 201;
   Mktg 360. Retailing system; organiza-
   tion, merchandising models, pricing,
   promotion, location, and control pro-
   cedures; management decision pro-
   cesses.

477 Promotion Management 3 Prereq Mktg
   360. Text and case approach to inte-
  grating promotion into the marketing
   plan; methods, organization, communi-
   cations, media selection, and campaigns.

478 Sales Management 3 Prereq QMeth
   215; Mktg 367. The role of selling in
   the marketing mix; problems in plan-
   ning, organizing, evaluating and con-
   trolling the sales force.

498 Internship in Business V 1-15 By inter-
   view only. Internship with a business
   organization in professional and man-
   agerial activities.

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

505 Survey of Marketing 3 Marketing man-
   agement; relevance of marketing to
   company profitability and consumer
   satisfaction; decision regarding price,
   product, promotion, and distribution.

506 Marketing Management and Adminis-
   trative Policy 3 Marketing management
   and administrative policies as they re-
   late to concepts, strategies, and deci-
   sion making.

560 Research Methodology 3 Prereq QMeth
   215. Types of data needed and avail-
   able, collection and analysis of data as
   they relate to decisional research.

565 Seminar in Marketing—Behavior/Eco-
   nomic Aspects 3 Marketing structure
   and behavior from economic and be-
   havioral perspectives; social evaluation
   and behavioral implications of market-
   ing strategy.

567 Consumer Behavior Theory 3 Prereq
   Mktg 505. Theory in consumer and
   buyer behavior; conceptual and empiri-
   cal research role of purchase and con-
   sumption behavior on society and mar-
   keting.

568 Social Issues in Marketing 3 Prereq
   Mktg 505. Productivity and efficiency
   in marketing; public policies and mar-
   keting structure and performance; mar-
   keting policies and consumer welfare.

596 Doctoral Seminar in Marketing 3 May
   be repeated for credit; cumulative max-
imum 9 hours. Advanced topics in marketing.

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.

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 applications.

444 Decision Analysis 3 Prereq QMeth 215. Bayesian analysis, decision theory, utility, subjective probability and multi-person 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.

540 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.


596 Doctoral Seminar in Quantitative Methods 3 May be repeated for credit; cumulative maximum 9 hours.

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.

Real Estate

RE

305 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.

405 Valuation and Location Theory 3 Prereq RE 305. Principles and practices of real property valuation; factors affecting real property values and income; appraisal and location theory.

406 Real Estate Administration 3 Prereq RE 305. The case method of analyzing management policies, practices, and decision making in real estate firms.

407 Real Estate Finance 3 Prereq Fin 325. Instruments, techniques, and institutions of real estate finance with emphasis upon the financial decision-making process.

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.

522 Advanced Topics in Real Estate 1 Basic forces that motivate and affect invest
ors in their use and possession of real estate.

600 Special Projects or Independent Study
   Variable credit.

702 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., or (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 special-
ization, 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

<table>
<thead>
<tr>
<th>General Courses</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>
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<tr>
<td>Cpt S 150 and one of 151, 153</td>
<td>4</td>
</tr>
<tr>
<td>154, or 241</td>
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<tr>
<td>Sciences (10 hours if Math 201 not</td>
<td>7</td>
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<td>included)</td>
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<tr>
<td>Social Sciences</td>
<td>3</td>
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<tr>
<td>Pol S or Hist</td>
<td>3</td>
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<tr>
<td>Psych 102 or Soc 101 or Anth 101</td>
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<tr>
<td>Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Electives1</td>
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<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Hours</th>
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</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>Mgt 350 Bus Info Systems</td>
<td>1</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Econ 301 Firm &amp; Market Policy</td>
<td>3</td>
</tr>
<tr>
<td>Mgr 491 or 492</td>
<td>3</td>
</tr>
</tbody>
</table>

1Excluding courses in physical education, business administration, hotel and restaurant admin-
istration, and economics.

Fields of Specialization

DEPARTMENT OF ACCOUNTING &
BUSINESS LAW

Accounting
The objective of the baccalaureate program
with a concentration in accounting is to pro-
vide basic conceptual accounting and business
knowledge as a foundation for accounting ca-
erre development. This would provide prepara-
tion for careers in public accounting, corpora-
tion 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; two of (one of which
must be accounting): Acctg 430, 431, 434,
435 or 438, Econ 320 or 340, Fin 423, 426,
427.

DEPARTMENT OF FINANCE AND
MARKETING

Finance
Preparation for careers in financial department
of business, commercial and investment banks,
governmental financial agencies, and other fi-
nancial institutions.

Junior and senior years: Acctg 330, 331;
Fin 425; one of Fin 426, 427, 429; Econ
320, and two electives from: R E 305, QMeth
412, Ins 420, 421, Fin 424, 427, 428, 429;
two additional 300-400-level electives from
accounting, economics, finance or any com-
bination.

Insurance
Preparation for careers in insurance agency,
actuarial science, claims, corporate risk man-
agement, investment, and underwriting.

Junior and senior years: Ins 320, 420, 421,
Mktg 460; one of Acctg 330, 335, 338; one of
Mgt 401, 440, 448, 450; one of B Law 410, 411, 414.

International Business
Preparation for careers with multinational corporations, governmental and intergovernmental agencies at home and abroad.
Junior and senior years: I Bus 380, 481, 482, B Law 415, Mgt 453 and Econ 470. Additional coursework from a “study abroad” or “residence” curriculum must be fulfilled.

Marketing
Preparation for careers in marketing management, manufacturers’ and wholesalers’ sales, retailing, and marketing research.
Junior and senior years: Mktg 367, 368, 460, 461 or 462, 477; two of the following (one of which must be in marketing): Mktg 461 or 462, 468, 470, 478, Econ 312, 364, 460, 470, I Bus 380, 482; and two elective courses as specified by the department.

Real Estate
Preparation for careers in real estate administration, appraisal, brokerage, finance, management, marketing, production, selling, and title insurance.
Junior and senior years: RE 305, 405, 406, 407, B Law 414, Mktg 460, and Econ 316; two of Ins 320, Acctg 335, Mktg 367, B Law 411, Fin 426, 428, Econ 312, 340, Arch 331, 342, Env S 444.

HOTEL AND RESTAURANT ADMINISTRATION
(see alphabetical listing)

DEPARTMENT OF MANAGEMENT AND SYSTEMS

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- to 400-level business elective; one 300- to 400-level business or Econ elective; one of Fin 426, Mgt 440, 450, or Mktg 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, 455, 456; Econ 350; three of QMeth 412, Psych 412, Mgt 448, Econ 450, 451; 400-level business elective.

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 241, 370; Mgt 448, 472; one of QMeth 344, 417; four of Cpt S 250, 260, 350, Acctg 330, 338, 433, Mgt 401, 440, 450, QMeth 412, 417 or 344 (opposite of choice above), 444.

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, 483, five of Acctg 338, QMeth 344, 412, 444, Econ 350, 450, W St 315, 400-level business elective and two 400-level management electives.

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 Mktg 460; two of Acctg 338, Mgt 448, Mktg 462, Cpt S 330, 370, Math 464, Stat 429, Econ 410, 411 or course approved by QMeth area.

Minor in Business Administration
Students must complete the following to receive a minor in business: Econ 201 (or 102 and 203), Acctg 230, Mgt 301, Mktg 360; B Law 210 or QMeth 215; one of Fin 325, or Econ 340.

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, 350, Mktg 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, 153, 154, 241; Math 201, 202; three Bus or Econ 300- or 400-level electives. 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.

The following courses should be completed prior to entering the graduate program: B Law 210, QMeth 215, Acctg 230, 231, Mgt 301, Fin 325, Mgt 340, Mktg 360; Econ 201 or 102, Econ 203, 301; Cpt S 150 and one of 151, 153, 154, 241; Math 201, 202. They may be taken after entering the program but will be considered as deficiency courses, not part of the regular degree program.

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. The curriculum in chemical engineering in the College of Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET).

The total number of majors in the department is restricted at the junior level.

The department offers courses of study leading to the degree of Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Ch E
101 Engineering Orientation 1 Engineering as a profession; career opportunities; general orientation for freshman engineers.
201 Chemical Process Principles and Calculations 4 Prereq Chem 106 or 116; Math 172. Fundamental concepts of chemical engineering; problem-solving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.
301 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 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 Unit Operations II 4 Prereq Ch E 330; major in Ch E. Design calculations, operation, and evaluation of equipment
used in distillation, extraction, absorption, drying, humidification, filtration, and other unit operations.

405 Chemical Engineering Principles 3 Prereq Chem 106; Math 315. Basic chemical engineering principles for non-majors. For engineering, chemistry, food science majors with an interest in chemical processing.

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.

412 Chemical Process Simulation I 2 Prereq Math 315; major in Ch E. Numerical methods for solving steady state chemical engineering problems.

413 Chemical Process Simulation II 1 Prereq Math 315; Ch E 350; major in Ch E. Numerical solutions to dynamic models of unit operations equipment.

414 Chemical Process Simulation III 1 Prereq Ch E 331, 421; major in Ch E; Ch E 451 or c-/ . Simulation and computer-aided design of complex chemical process units.

421 Kinetics and Reactor Design 3 Prereq major in Ch E; Chem 351; 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 Process Control 3 Prereq Math 315; major in Ch E. Measuring instruments, automatic control, process and instrument characteristics and theory applied to industrial control problems.

451 Process Development, Design and Evaluation 3 Prereq Ch E 301, 331; major in Ch E. Development, design and economic evaluation of chemical and related processes as practiced in industry.

461 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.

475 Introduction to Biochemical Engineering 3 Prereq Ch E 331. Application of chemical engineering principles to the processing of biological and biochemical materials. (a/y)

480 Introduction to Extractive Metallurgy 3 Prereq Chem 331 or MSE 412. Processes for recovery of metals; physical and chemical principles of mineral processing, pyrometallurgy, hydrometallurgy, and electrometallurgy. (a/y)

495 Chemical Engineering Internship 2 May be repeated for credit; cumulative maximum 4 hours. Students 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.

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 (Ch E DS15).

515 Convective Heat Transfer V 1-3 Same as M E 515.

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 (Ch E DS27).

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 (Ch E DS29).

532 Transport and Reactions in Multiphase Processing 3 Prereq Ch E 331. Moment-
um, 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 (CHE ID 541).

542 Chemical Engineering Analysis II 3 Prereq Ch E 541. Numerical and analytical methods in the solution of chemical engineering problems; partial differential equations, statistical model building, integral transforms. Joint course taught with the University of Idaho (CHE ID 542).

545 Mass Transfer Operation I 2-3 Diffusional and equilibrium operations. Joint listing with the University of Idaho (CHE ID 545).

546 Mass Transfer Operations II 2-3 Diffusional and equilibrium operations. Joint listing with the University of Idaho (CHE ID 546).

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 (CHE ID 571).

560 Biochemical Engineering 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 (CHE ID 560).

580 Advanced Extractive Metallurgy: Fundamentals and Modeling 3 Prereq Chem 331, Math 315, Ch E 301, or MSE 412. Fundamentals of extractive metallurgical processes; mathematical modeling of processes and equipment. (a/y)

581 Advanced Topics in Chemical Engineering V 1-3 Filtration, reaction engineering, two-phase flow, non-Newtonian fluids, interfacial phenomena, fluidization, novel separations.

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.

**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
- Chem 105 Principles
- Engl 101 Composition
- Hum Elective*
- Cpt S 203 Cpt Prog Eng

**Hours**

- 4
- 4
- 3
- 3
- 2

**Second Semester**

- Math 172 Calculus II
- Math 220 Int Lin Alg
- Chem 106 Principles
- Chem 107 Qual Analysis
- Phys 201 Class Phys
- Soc S Elective*

**Hours**

- 4
- 2
- 3
- 2
- 4
- 3

**Sophomore Year**

**First Semester**

- Chem 221 or 217
- Phys 202 Class Phys
- Math 273 Calculus III
- Math 315 Diff Eq
- Bio S Elective

**Hours**

- 4
- 4
- 2
- 3
- 3

**Second Semester**

- Ch E 201 Ch Proc Prin
- Ch E 213 Stat & Stgr Matl
- Engl 201 Expo Writing
- Hum Elective*
- Math 440 Adv Engr Math

**Hours**

- 4
- 4
- 3
- 3
- 3

**Junior Year**

**First Semester**

- Ch E 330 Unit Oper I
- Chem 340 Organic
- Chem 341 Org Chem Lab
- Chem 331 Phys Chem
- Econ 201 Contem Econ

**Hours**

- 4
- 3
- 2
- 3
- 4

**Second Semester**

- Ch E 301 Ch E Thermo

**Hours**

- 3
Ch E 331 Unit Oper II 4
Chem 342 Organic 3
E E 301 El Eng Fund 3
E E 302 E Fund Lab 1
Chem 336 Class P Chem\textsuperscript{3} 2
Ch E 412 Proc Sim I\textsuperscript{3} 3

**Senior Year**

**First Semester**

Ch E 411 Proc Simuln\textsuperscript{3} 3
Ch E 421 Kinetics 3
Ch E 433 Ch E Lab\textsuperscript{4} 2
Ch E 498 Tech Seminar 1
Ch E Elective\textsuperscript{*5} 3
Technical Elective\textsuperscript{*6} 3
Ch E 413 Proc Sim II\textsuperscript{3} 1
C E 469 Engr Admin 3

**Second Semester**

Ch E 433 Ch E Lab\textsuperscript{3} 2
Ch E 441 Proc Control 3
Ch E 451 Design 4
Ch E 498 Tech Seminar 1
Ch E Elective\textsuperscript{*5} 3
Technical Elective\textsuperscript{*6} 3
Ch E 414 Proc Sim III\textsuperscript{3} 1
Adv Hum or Soc S Elective\textsuperscript{*7} 3

\textsuperscript{1}Well qualified students are encouraged to take Chem 111, 116, 117 in place of Chem 105, 106, 107.

\textsuperscript{2}Not required for students commencing freshman year in fall 1984.

\textsuperscript{3}Required for students commencing freshman year in fall 1984.

\textsuperscript{4}Ch E 433 must be taken for two semesters. It should be taken during the senior year.

\textsuperscript{5}Select from approved list of courses on file in departmental office.

\textsuperscript{6}A technical subject approved by the department chair before enrollment.

\textsuperscript{7}Must be an upper-division course continuing some prior field of study.

**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 sophomores' professional requirements and course sequences. A strong preparation 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 ABET 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 Chemical Engineering.

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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 chemistry 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.

Undergraduate 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.

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

510 Solid State Direct Energy Conversion 3 Same as E E 510.

517 Electrical, Magnetic, Optical, and Con-ductive Properties of Solids 3 Same as E E 517.

538 Special Topics V 1-3. May be repeated for credit. Selected subjects in molecular structure, spectroscopy, solid state, and surface physics.

561 Atomic and Molecular Physics 3 Same as Phys 561. Graduate level counterpart of Ch P 461; additional requirements. Credit not granted for both Ch P 461 and 561.

562 Theoretical Methods in Chemical Physics 3 Operator techniques; molecular dynamics; many electron theory; molecular applications of quantum electrodynamics; magnetism; photophysical and photochemical processes; nonlinear optical phenomena. (a/y)

564 Atomic and Molecular Phenomena 3 Prereq Ch P 461; Chem 509; Phys 450. Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases. (a/y)

590 Seminar 1 May be repeated for credit.

800 Special Projects or Independent Study Variable credit.

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

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**Department of Chemistry**


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 chem-
istry. 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, characterization of solid surfaces, chemometrics, 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; organotransition metal compounds; 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, tunneling, 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; 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 program 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 115, 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; 115 and 116/117.

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, 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, 115
(b) Chem 106/107, 116/117
(c) Chem 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 biological 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 [P] Principles of Chemistry 4 (3-3)
Prereq satisfactory Chem Placement Test, or Chem 101 or 104; Math 107 or 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, basic; 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/+. Qualitative analysis; identification of various cations and anions.

115 [P] Chemical Principles Honors 4 (3-3)
Prereq Math 107 or c/+. Superior physical science placement test score. Topics as for Chem 105, enriched by special lectures and demonstrations. For students with adequate background in science and mathematics.


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/+. Independent study in the theory and practice of modern chemistry; written report required.

298 [P] Physical Science Honors 4 (3-3)
Prereq Math 198.

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.

504 Organometallic Chemistry 3 Prereq Chem 502. Chemistry of organotransition metal compounds and their applications in organic synthesis and catalysis. (a/y)

Analytical, Environmental, and Radiochemistry

Chem


222 Quantitative Analysis Laboratory 2 (1-6) Prereq Chem 107 or 117; c/ in Chem 220.


422 Radiochemistry Laboratory 1 (0-3) Prereq Chem 222, 331; Phys 202. Credit not granted for both Chem 422 and 522.

423 Nuclear Chemistry and Technology 3 Prereq Chem 421/521. Credit not granted for both Chem 423 and 523. (a/y)

424 Activation Analysis 2 (1-3) Prereq Chem 421 or 331. Credit not granted for both Chem 424 and 524. (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 Lab-
Laboratory experience in modern analytical methods.

427 Environmental Chemistry 2 Prereq Chem 420/520. Credit not granted for both Chem 427 and 527. (a/y)

512 (528) Microprocessors 1 Prereq Chem 425. (a/y)

513 (527) Chemometrics 1 Prereq Chem 425. (a/y)

514 (525) Mass Spectrometry 1 Prereq Chem 425. (a/y)

515 (524) Trace Analysis 2 Prereq Chem 425. (a/y)

516 Local and Surface Microanalysis 2 Prereq Chem 425. (a/y)

517 (521) Chromatography 2 Prereq Chem 425. (a/y)

518 (522) Electrochemistry 2 Prereq Chem 425. (a/y)

519 (526) Analytical Spectroscopy 2 Prereq Chem 425. (a/y)

520 Advanced Analytical Chemistry 2 Prereq Chem 425. Chemical equilibria in aqueous and non-aqueous systems; chelation titterations; oxidation-reduction; multistage separation; statistical treatment of chemical data; sampling. (a/y)

521 Radiochemistry and Radiotracers 2 Graduate level counterpart of Chem 421; additional requirements. Credit not granted for both Chem 421 and 521.

522 Radiochemistry Laboratory 1 (0-3) Graduate level counterpart of Chem 422; additional requirements. Credit not granted for both Chem 422 and 522.

523 Nuclear Chemistry and Technology 3 Graduate level counterpart of Chem 423; additional requirements. Credit not granted for both Chem 423 and 523.

524 Activation Analysis 2 (1-3) Graduate level counterpart of Chem 424; additional requirements. Credit not granted for both Chem 424 and 524.

527 Environmental Chemistry 2 Graduate level counterpart of Chem 427; additional requirements. Credit not granted for both Chem 427 and 527.

529 Selected Topics in Analytical Chemistry V 1-3 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 220, 222; 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.


336 Classical Physical Chemistry 2 Prereq Chem 331. Concepts and applications of classical physical chemistry; transport and kinetic properties; electrochemistry; colloids; polymers and macromolecules.

409 Chemical Group Theory 3 Prereq Chem 352. 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 equi-
libria, 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. Empirical, semi-empirical, and ab initio methods of quantum chemistry applied to determination of chemical properties and reactivity.

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 V 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 116 and 117.


341 Organic Chemistry Laboratory 2 (0-6) Prereq Chem 106 and 107, or 116 and 117; 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.

445 Organic Reactions 3 Prereq Chem 342. Selected organic reactions including mechanisms at an intermediate level.

540 Organic Reaction Mechanisms 3 Prereq Chem 331, 342. The major classes of organic reaction mechanisms and their significance; kinetics and introductory theory.

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 1 For Chem or Biochem majors only.

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

555 Approaches to Chemistry Teaching 1 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.
Program in Chicano Studies

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 undergraduate coordinator to arrange a schedule which will permit completion of required courses in proper sequence.

Freshman Year

First Semester
Chem 105 or 115 Principles^1 4
Math 108 Precalculus 2
Engl 101 Composition 3
Bio S 102 or 103 3
Elective 2

Second Semester
Chem 106 or 116 Principles^1 3
Chem 107 or 117 Qual Analysis 2
Math 171 Calculus I 4
Hum or Soc S Elective 6
Elective 2

Sophomore Year

First Semester
Chem 220 Quant Analysis^1 2
Chem 222 Quant Analy Lab 2
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
For L 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
For L 102 Second Semester 4
Hum or Soc S Elective 5
Elective^2 3

Senior Year

First Semester
Chem 401 Inorganic 3
Electives^2 12

Second Semester
Chem 425 Adv Analytical 2
Chem 426 Adv Analytical Lab 2
Electives^2 11

^1Highly qualified students are encouraged to take Chem 115, 116, 117 in place of Chem 105, 106, 107. Students who have taken Chem 101 must take Chem 105, 106, 107, 220, 222, or 102, 106, 107, 220, 222.

^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 chemistry. The student should also present 8 hours of physics, mathematics through calculus, and have a reading knowledge of scientific German, French or Russian.

It is desirable that students interested in inorganic, analytical, organic, or physical chemistry present advanced courses in chemistry, physics, computer science, or mathematics; advanced biological science courses are important preparation for students who propose to undertake graduate study in the field of biochemistry.

Program in Chicano Studies

Associate Professor, F. V. Padilla; Assistant Professor, F. Garcia.
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, the humanities, and fine arts.

For majors and non-majors Chicano Studies courses provide a broad interdisciplinary program at the undergraduate level that 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 Spanish. Course work in Spanish is strongly urged.

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 study in some departments, this program does not offer an advanced degree.

### Description of Courses

*For explanation see Index under "Symbols"

102 English Composition for Chicanos 3 Composition taught within the context of the Chicano linguistic and cultural experience in a pluralistic society.

110 [K] Introduction to Chicano Studies 3 Chicano culture and peoples (Americans of Mexican descent); historical backgrounds and contemporary conditions.

220 Mexican Art History 3 Same as F A 204.

248 Patterns of Chicano Family 3 Same as CFS 248.

272 Chicano Ethnohistory 1521-1910 3 The development of La Raza from 1521 to 1910; major historical and cultural aspects of the La Raza peoples.

313 Social Psychology and the Chicano Community 3 Psychological problems facing the Chicano in society; development of the Chicano child to adulthood.

321 Chicano Art 3 Prereq Ch St 220. Survey of the artistic expression of the Chicano community from early Spanish settlement to present day in the U.S.

324 Spanish for Chicanos I 3 Same as Span 324.

325 Spanish for Chicanos II 3 Prereq Span 324; fluency in Spanish. 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 Bicultural Education 3 Philosophical, legal, cultural, linguistic, and curricular aspects of bilingual education.

340 Chicano Dance and Theater 2 Historical and present day images of the Chicano through dance and oral performance; beginning and intermediate levels.

375 Chicano Community Political Organizations 3 Literature on the character, role, and function of Chicano community political organization from 1846 to present.

383 Sociology of Chicanos 3 Same as Soc 383.

410 Ethnic Groups and Public Education 2 or 3 Same as Educ 410.

411 Bilingual Methods and Materials Across Content Areas 3 Same as Educ 411.

413 Latin American Governments 3 Same as Pol S 413.

493 Special Topics in Chicano Studies 3 May be repeated for credit.

499 Special Problems V 1-4 May be repeated for credit.
Department of Child and Family Studies

Professor and Acting Chair, D. A. Dillman; Professors, D. Z. Price, M. O. Galkewy; Associate Professors, M. P. Ray, A. S. Richars; Assistant Professors, J. J. Dillman, J. C. Rogers.

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. 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 is 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.

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 Child and Family Studies and Master of Arts in Child and Family Studies with a specialization in consumer studies, family studies (family relations 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 0-18 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 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 0-18 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 203; CFS 350. Family’s relation 
to consumer movement; consumer 
isues; interaction of consumers, govern-
ment, and market; evaluation of con-
sumer information and protection.

353 Family Housing Decisions 3 Prereq Soc 
101; Psych 101 or 102. Housing alter-
atives 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 450.

442 The Child and Family in Poverty 3 
Prereq Psych 102; 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.

448 Parent-Child Relationships 3 Prereq 
CFS 240, 247. Effects of parent behavior 
on children’s social and cognitive de-
velopment: influences of children on 
parents; methods of changing parent-
child relations.

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 prin-
ciples and processes concerning individ-
uals, families, and community/service 
agencies.

454 Topics in Family Financial Problems 
1-3 May be repeated for credit; cumu-
late maximum 9 hours. Prereq Econ 
102 or 203; Soc 101; CFS 350; or 9 hrs 
social science. Role of family in econ-
omy; effect of specified social, eco-

495 Instructional Practicum V 1-4 May be 
repeated for credit; cumulative max-
umum 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 place-
ment.

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

503 Early Childhood Education 3 Develop-
ment of on-going programs in early 
childhood education. Cooperative course 
taught at the University of Idaho (Ed 
ID503).

505 Current Consumer Issues 2 May be re-
peated for credit. Prereq Econ, con-
sumer or finance course; 3 hrs Psych 
or Soc. Major problems facing con-
sumers; theoretical and practical 
implications for families. (SS)

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, rele-
vant professions and problem areas 
in child and family studies.

542 Seminar in Methods of Developmental 
Research 3 Prereq 6 hrs child develop-
ment. Methodology in developmental 
research; applications to current prob-
lems.

546 Organization and Administration of 
Human Service Programs 3 Legislation, 
management, programs, personnel, fi-
ances, resources, and relationships with 
other agencies.

548 Topics in Child and Family Studies 2 
or 3 May be repeated for credit; cumu-
late maximum 9 hours. By interview 
only. Current topics in child and family 
advocacy.
Seminar in Child and Family Studies 1
May be repeated for credit; cumulative maximum 4 hours.

Family Decision Styles 3 Prereq 12 hrs Soc S. Effects of varying value patterns and decision styles on individuals within a family. (a/y)

Family Consumption Behavior 3 Prereq Econ 201 or 203; CFS 352, 452, or Econ 312. Consumer decisions as affected by psychological, sociological and economic factors. (a/y)

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.

Sex Roles in Society 3 Examination of changing roles of males and females in terms of sociological theories of social and institutional change.

Social Policy, Law, and the Family 3 Implications of social policy, law for family structure and function, individual development; effects of policy alternatives.

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.

Seminar in Developmental Research Topics 3 Prereq 6 hrs child development. (a/y)

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 department majors.

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.

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.

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 102, English 101, FSNH 150, 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; Soc 342 or 350; CFS 352, 353, 454, and 498; one course in statistics; one course in computer science. 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.

**PRESCHOOL OPTION**
Bio S 102 or Chem 101; GenCB 201; Mus 388 or 390; Spe 364, 371; Psych 360, 464 or 473; Soc 320, 351; S W 390 or 395; CFS 240, 242, 247, 342, 344, 440, 446, 447, 448, and 449.

**CHILD DEVELOPMENT OPTION**
Chem 101 or Zool 251; GenCB 201; Soc 320, 351, 450; S W 395; Psych 285, 311, 430, 490, 390 or 360; Psych 321 or Soc 350; CFS 240, 242, 247, 342, 344, 440, 446, 447, 448, and 449.

Department of Civil and Environmental Engineering


Civil Engineers plan, design, construct, and operate the physical works and facilities es-
sential to modern life. Civil Engineers are responsible not only for creating the facilities required by a modern civilization, but also are committed to the conservation and preservation of the environment. Examples of these facilities include bridges, highways, buildings, airports, flood control structures, purification plants for drinking water, waste treatment and disposal facilities, offshore structures, tunnels, irrigation systems, space satellites, and launching facilities.

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, geotechnical, hydraulic, structural, and transportation engineering.

The program leading to the Bachelor of Science degree in Civil Engineering is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

The curriculum includes the latest concepts in computer-aided design and computer applications in solving civil engineering problems.

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 use their surveying skills to obtain better summer jobs. In addition, surveying skills are valuable 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 ever-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, Master of Science in Environmental Engineering, and Doctor of Philosophy (Civil Engineering). The department participates in interdepartmental programs leading to the degrees of Bachelor and Master of Science in Geological Engineering, Master of Science in Environmental Science, and Master of Regional Planning.

**Description of Courses**

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<tr>
<td><strong>For explanation see Index under “Symbols”</strong></td>
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<tr>
<td><strong>C E</strong></td>
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<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>174 Introduction to Meteorology and the Atmospheric Environment 3 Introduction to meteorology, the atmospheric processes; weather, air pollution, and environmental topics.</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</td>
</tr>
</tbody>
</table>

145
overview, systems approach, project scheduling, problem modeling, optimization, decision making.

301 Principles of Surveying 3 (1-6) Prereq Math 171; M E 101. Basic principles for using instruments and equipment in conducting engineering surveys. (SS)

302 Engineering Surveys 3 (1-6) Prereq C E 301. Field work in application of principles presented in C E 301. (SS)

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 (CE ID317).

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 (CE ID319).

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. Joint listing with the University of Idaho (ES ID340).


317 Geotechnical Engineering I 3 (2-3) Prereq Geol 102; C E 314 or c/f. Structure, index properties, and classification of soils; compaction; effective stress; seepage; consolidation and shear strength.

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.

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.

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.

342 Water and Wastewater Treatment 3 Prereq C E 341; certified engineering or environmental science majors only. Water and wastewater treatment processes and design.

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.

403 Environmental Geology 3 Same as Geol 403.

405 (524) Geophysical Engineering 4 (3-3) Theory and application of exploratory procedures in engineering and geological investigations; review of techniques. Credit not granted for both C E 405 and 505.

409 Numerical Geology 3 Same as Geol 409.

414 Structural Design Laboratory 2 (0-6) Prereq C E 431, 433. Senior design lab 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 315. Experiments related to fluid flow principles and their application to hydraulic engineering.

417 Geotechnical Engineering II 3 Prereq C E 317. Soil improvement and stabilization; advanced consolidation and shear strength theory; lateral earth pressure and slope stability.

421 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
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.
435 Foundations 3 Prereq C E 317, 433. Analysis and design of foundations; footings, piles, retaining walls, sheet pilings; cofferdams; caissons, waterfront structures, piers and abutments.
436 Design of Timber Structures 3 Prereq C E 330 or C/. 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, computer application.
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 (CE ID422).
451 Open Channel Flow 3 Prereq C E 315. Steady, non-uniform flow; controls and transitions in fixed-bed channels.
460 Intermediate Hydrology 3 Prereq C E 351. Weather and precipitation; watershed characteristics; runoff; return frequencies; overland flow and hydrograph analyses; introduction to computer modeling; design applications.
462 Engineering Law and Contracts 2 Development of law, courts, and ethics; law on contracts, agency, sales, property, and patterns; specifications; preparation of contract documents. Cooperative course taught at the University of Idaho (C E ID 484).
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 scheduling, job planning, project control, records and policies, and construction equipment.
470 Fundamentals of Air Pollution 3 Prereq Chem 102. Source, magnitude, and impact; chemistry of urban atmospheres, photochemistry of smog, and meteorological factors.
471 Meteorology 2 Prereq Phys 101 or 201. Meteorology and atmospheric science applied to problems in physical, environmental, agricultural, and engineering sciences; weather modification, climate change, energy problems.
474 Highway Design and Operation 3 Prereq C E 322. Fundamentals of geometric design and traffic engineering for urban and rural highways. Cooperative course taught at the University of Idaho (CE ID 474).
475 Groundwater Hydrology 3 Same as Geol 475. (a/y)
480 Senior Seminar 1 Professional aspects of civil engineering.
491 Remote Sensing and Geologic Applications 3 (2-3) Same as Geol 491. Credit not granted for both C E 491 and 591.
495 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.
499 Special Problems V 1-4 May be repeated for credit.
501 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.
505 Geophysical Engineering 4 (3-3) Graduate level counterpart of C E 405; additional requirements. Credit not granted for both C E 405 and 505.
506 Design and Construction of Water Wells 3 Analysis of geologic and engineering factors important in design, construction, and maintenance of
water wells. Cooperative course taught at the University of Idaho (Hydro ID 575).

507 Seepage and Earth Dams 3 Principles of earth-dam design, failures, considerations in construction; principles governing flow of water through soils. Cooperative course taught at the University of Idaho (Geol E ID 555).

508 Air Pollution Control Engineering 3 Prereq senior in Engr or Phs. Measurement and control of air pollution; engineering design calculations; equipment and process.

510 Advanced Topics in Geological Engineering V 2-4 May be repeated for credit; cumulative maximum 9 hours. Soil dynamics, theoretical soil mechanics, numerical methods in soil mechanics, and geohydrology, engineering geology, cold regions geoenvironmental advanced laboratory testing.

511 Seismic Hazard Assessment 3 Prereq C E 417, 403. State-of-the-art methods in geotechnical engineering to assess earthquake and related ground failure hazards of an area.

512 Dynamics of Structures 3 Behavior of structures under impact, impulse, and seismic loads. Joint listing with the University of Idaho (CE ID543).

513 Theory of Elastic Stability 3 Elastic and inelastic buckling phenomena of bars, beams, frames, and plates.

514 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.

515 Environmental Measurements 3 (1-6) Graduate level counterpart of C E 415; additional requirements. Credit not granted for both C E 415 and 515.

516 Unsteady Closed-Conduit Flow 3 Prereq C E 551. Derivation of governing equations; finite difference methods; methods of characteristics; boundary conditions; computational procedures; transients caused by centrifugal pumps.

517 Unsteady Open-Channel Flow 3 Prereq C E 451. Derivation of governing equations; explicit and implicit finite difference methods; computational procedures; stability and convergence.

518 Advanced Hydrology 3 Prereq C E 460. Principles of the hydrologic cycle in mountainous areas; precipitation, snowmelt, and systems simulation. Cooperative course taught at the University of Idaho (Ag E ID 551).

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 control problems and air pollution control engineering.

526 Engineering Geology and Geotechnics 3 Graduate level counterpart of C E 426; additional requirements. Credit not granted for both C E 426 and 526.

527 Advanced Soil Mechanics 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 (CE ID561).

528 Advanced Foundation Engineering 3 Prereq C E 317. Consolidation theories, bearing capacity, and settlements of foundations, pile group behavior, theory of subgrade reaction, material foundations, laterally loaded piles. Cooperative course taught at the University of Idaho (CE ID562).

530 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.

531 Advanced Structural Design 3 Advanced concepts in structural design; computer-aided design.

532 Finite Elements 3 Theory of finite elements; applications to general engineering systems considered as assemblies of discrete elements.

534 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.

537 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/sy)

540 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)

541 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 (CE ID 531).

542 Environmental Engineering Unit Processes 3 Prereq C E 541. Biochemical energetics and kinetics; biological waste treatment processes; nutrient removal; advanced wastewater treatment design. Joint listing with the University of Idaho (CE ID 532).

543 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.

544 Wastewater Treatment System Design 3 (2-3) Prereq C E 542 or c/f. Application of unit operations and processes to design of integrated treatment systems; critical review of designs. Joint listing with the University of Idaho (CE ID 536).

545 Industrial Waste Problems 3 Prereq C E 542 or c/f. Evaluation and feasible solutions of industrial waste problems. (a/y)

546 Water Quality Management 3 Prereq C E 542. Principles of systems analysis applied to engineering management of water quality problems. (a/y)

547 Radiological Health 3 (2-3) Sources and units of radiation and radioactivity, radiological health, radiation detection, and radioactive waste disposal. (a/y)

548 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.

549 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)

550 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.

551 Advanced Topics in Hydraulic Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 315. Cavitation, air entrainment, hydraulic machinery, similitude, mixing in rivers and estuaries, hydraulic design.

552 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)

553 Hydraulic Design 3 (2-3) Dams, spillways, and outlet works; design of major structures. Cooperative course taught at the University of Idaho (CE ID 522).

554 Natural Channel Flow V 2-3 Hydraulic of non-uniform flow in irregular channels; unsteady flow; routing and density currents. Cooperative course taught at the University of Idaho (Ag E ID 555).

555 Numerical Modeling in Fluid Mechanics 3 Prereq M E 313. Fundamentals concepts in development of numerical models for fluid flow with applications to steady and unsteady flows. (a/y)

556 Topics in Fisheries Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 315. Application for fluid mechanics and hydraulics to current fisheries engineering problems; habitat improvement, fishways, culvert passage, instream flow needs. (a/y)


558 Stochastic Hydrology 3 Prereq C E 351. Applications of probability in hydrology; analyses and evaluation of hydrologic data; regression analysis and simulation techniques. (a/y) Joint listing with the University of Idaho (CE ID 528).

559 Advanced Topics in Hydrology V 1-3 Prereq C E 460. Separate compounds in the hydrologic cycle; computer-based
simulations and data analyses of isolated or combined events.

561 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 (CE ID523).

562 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 (CE ID524).

563 Hydropower Planning V 
1-3 Prereq C E 351. Feasibility studies of potential hydropower siting; hydraulics, site economics, licensing requirements, operations and environmental assessments.

564 Hydropower Design V 
1-3 Prereq C E 351. Hydraulic design of hydropower facilities; earth and concrete dams; spillways and energy dissipators; intakes, water conveyance facilities, turbines and related equipment.

571 Air Pollution Meteorology 3 
Prereq Math 315; 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 3 
(2-3) Prereq Chem 217 or 241; Phys 102. Sampling and identification of air pollutants by chemical and physical methods, survey design, industrial stack sampling, data presentation.

573 Air Pollution Abatement and Administration 2 
Prereq Math 315; Phys 102. 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.

577 Advanced Groundwater Hydrology 3
Same as Geol 577.

580 Graduate Seminar 1 
May be repeated for credit; cumulative maximum 2 hours. Lectures and reports on current developments in research and practice.

581 Sanitary Engineering Analysis 2 
(1-3) Prereq C E 541. Theoretical and laboratory methods for development of design criteria for sanitary engineering systems.

582 Microcomputer Aided Design in Environmental Engineering 2 (1-3) Prereq basic programming. Programming; interaction with the microcomputer in the analysis and design of unit processes and systems.

583 Engineering Aspects of Aquatic Chemistry V 
2-4 Prereq C E 542. Chemical principles as applied to water supply and pollution control engineering.

584 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.

586 Applied Stream Sanitation 3 
Prereq C E 341, 415/515. Assimilating capability and complex self-purification capacity of a natural water system.

588 Atmospheric Turbulence and Air Pollution Modeling 3 
Prereq C E 571. Physical aspects of atmospheric turbulence, theoretical developments in atmospheric diffusion, and applied computer modeling with regulatory and research models.

589 Atmospheric Chemical and Physical Processes 3 
Prereq C E 571. Processes of removal of pollutants from the atmosphere; radical chain reactions, particle formation, model calculations.

591 Remote Sensing and Geologic Applications 3 
(2-3) Graduate level counterpart of C E 491; additional requirements. Credit not granted for both C E 491 and 591. Same as Geol 591.

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

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 may be taken on a pass/fail basis.

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
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</table>
**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 220 Linear Alg</td>
<td>2</td>
</tr>
<tr>
<td>Math 273 Calculus III</td>
<td>2</td>
</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>
<td>2</td>
</tr>
<tr>
<td>Bact 101 Introduction</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 315 Diff Eq</td>
<td>3</td>
</tr>
<tr>
<td>M E 320 Materials Lab</td>
<td>1</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>
<td>3</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
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</tbody>
</table>

**Summer Engineering Program**

| C E 301 Prin of Surveying | 3 |
| C E 302 Engineering Surveys | 3 |

**Second Semester**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>C E 315 Mech of Fluids</td>
<td>3</td>
</tr>
<tr>
<td>C E 317 Geotech Engr</td>
<td>3</td>
</tr>
<tr>
<td>Stat 360 Statistics</td>
<td>3</td>
</tr>
<tr>
<td>C E 330 Mech of Structures</td>
<td>4</td>
</tr>
<tr>
<td>C E 341 Water Supply</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>C E 322 Transportation Engr</td>
<td>3</td>
</tr>
<tr>
<td>C E 342 Water &amp; Wastewtr 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>
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<tr>
<td>E E 301 E E Fund</td>
<td>3</td>
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**Senior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>C E 431 Structural Steel Design</td>
<td>3</td>
</tr>
<tr>
<td>C E 463 Administration</td>
<td>3</td>
</tr>
<tr>
<td>Dept Elect(^1)</td>
<td>3</td>
</tr>
<tr>
<td>M E 301 Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Com Prof Elective</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Dept Elect(^1)</td>
<td>5</td>
</tr>
<tr>
<td>C E 480 Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Engl 402 Prof Writing</td>
<td>3</td>
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</tbody>
</table>

Hum or Soc S Electives\(^2\) 3

Hum Elective 3

\(^1\) The 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.  

\(^2\) Departmental 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 45 semester hours of course work and who have completed Math 171, 172, 220, 273; Phys 201, 202; C E 211 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 department participates in the program and each student interested in civil engineering is assigned a civil 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. During CAP and Pre-Engineering tenure, the student will take the prerequisite courses necessary for certification into 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 prepara-
tion 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**

*Chair, J. Thompson; Professor, M. Perry; Associate Professors, R. Benhamou, D. Harrison, J. M. Klopf; Assistant Professors, C. Bicknell, J. Rogers.*

The Department of Clothing, Interior Design, and Textiles offers undergraduate and graduate programs in clothing and textiles and interior design leading to degrees of Bachelor of Arts in Clothing and Textiles, Bachelor of Arts in Interior Design, Bachelor of Science in Home Economics, and Master of Arts in Home Economics.

**CLOTHING AND TEXTILES**

A major in clothing and textiles permits a concentration in merchandising or in a special concentration. The merchandising concentration combines departmental courses with courses in business and economics, fine arts, social sciences, and computer science. Students in merchandising are prepared for positions of management in retailing and apparel production firms. The career objectives of students in the special concentration could be fashion communication, textile research, social-psychological or historical/cultural aspects of clothing or fashion design.

**Description of Courses**

*For explanation see Index under "Symbols"*

**Clothing and Textiles**

C T

108 Merchandising Options 2 Structure and operation of the textile/apparel retail complex; career opportunities in the fashion business.

215 Textile Fundamentals 3 (2-3)

216 Clothing Construction Concepts 3 (2-3) Prereq C T 215; ID 101 or c/c. Construction and fitting principles.

217 Clothing and Human Behavior 2 Prereq Soc 101; Psych 101. Interdisciplinary approach to clothing; psychological, sociological, physical, and economic aspects.

311 Flat Pattern 3 (1-6) Prereq C T 216. Development of clothing design from a basic pattern.

313 Weaving 3 (1-6) Principles, techniques, and aesthetics of hand weaving. Cooperative course taught at the University of Idaho (HE ID 314).

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 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. 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 1-6 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. (SS)

491 Professional Seminar 1 Preparation for professional experience; analysis of the demands of the profession; improving relevant skills; obtaining internship position.

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. (SS)

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.

519 Research Seminar V 2-3 Literature review; preparation and review of reports.

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 Clothing and Textiles.

Freshman Year

First Semester

Hours
Engl 101 Composition 3
Soc 101 or Anth 101 3
Math 101 or Elective 3
FSHN 150 or Sci Elective (GUR) 3
C T 108 Merch Options 2

Second Semester

Hours
I D 101 Basic Env Design 3
Psyc 101 or 102 3
Chem 101 or 105 4
Spc Elective (GUR) 3
Hum or Soc S Elective (GUR) 3

Sophomore Year

First Semester

Hours
C T 215 Textile Fundamentals 3
C T 216 Cl Constr Con 3
F A History (GUR) 3
Econ 102 3
Electives 3

Second Semester

Hours
C T 217 Intro to Clothing 2
Econ 203 Fund Micro 3
B Law 210 Law & Bus I 3
Math 201 Finite Math 3
Elective 3

Junior Year

First Semester

Hours
CIDT Elective 3
Acctg 230 Prin Acctg I 3
Mktg 360 Marketing 3
C T 577 Visual Merch 2
CFS 350 Dec Making 3

Second Semester

Hours
C T 315 Textile Prod 3
Mktg 367 Consumer Beh 3
CIDT Elective 3
Electives 6

Senior Year

First Semester

Hours
C T 413 Clothing Cons 3
CIDT Elective 3
Mgt 301 Prin Mgr Org 3
Electives 6

Second Semester

Hours
C T 418 Fashion Theory 3
C T 419 or I D 491 1
Cpt S 220 or 405 3-4
Department of Communications


The curricula in the Department of Communications are designed to prepare students for careers in the mass media and communication-related fields. Although focus is placed on the knowledge and skills essential in these areas, the department builds on 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 and Home Economics.

Description of Courses

Enrollment in all 300- and 400-level courses, except PR 312 and GUR courses is limited to certified Com majors or certified majors whose degree programs require these courses.

For explanation see Index under "Symbols"

Inter-Sequence Courses

determinants. Credit not granted for both Com 460 and 560.
470 Mass Communications Theories and Theory Construction 3 Traditional and new theories of mass communications and the process of theory construction. Credit not granted for both Com 470 and 570.
475 Seminar in Communications 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. For seniors and graduate students.
481 Media Management 3 For seniors and graduate students.
490 Research Methods 3 Credit not granted for both Com 490 and 590.
495 Professional Internship V 9-12 By interview only. Credit not granted for both Com 395 and 495.
499 Special Problems V 1-4 May be repeated for credit.
501 Research Methods in Communications 3 Theory, methods, and practice of research.
520 New Communication Technologies 3 Graduate level counterpart of Com 420; additional requirements. Credit not granted for both Com 420 and 520.
540 Media Ethics 3 Graduate level counterpart of Com 440; additional requirements. Credit not granted for both Com 440 and 540.
550 Mass Media and the First Amendment 3 Graduate level counterpart of Com 450; additional requirements. Credit not granted for both Com 450 and 550.
560 Mass Media Criticism 3 Graduate level counterpart of Com 450; additional requirements. Credit not granted for both Com 460 and 560.
570 Mass Communications Theories and Theory Construction 3 Graduate level counterpart of Com 470; additional requirements. Credit not granted for both Com 470 and 570.
590 Research Methods 3 Graduate level counterpart of Com 490; additional requirements. Credit not granted for both Com 490 and 590.
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.

Advertising
Adver
280 Advertising Principles and Practices 3
Not open to freshmen.
380 Advertising Copywriting and Creative Strategies 3 (2-3) Prereq Adver 280; major in Com. Development of effective advertising copy and creative strategies.
382 Media Planning 3 Prereq Adver 280; major in Com. Media planning theories, strategies, and practices.
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 V 9-12 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
255 Introduction to Broadcasting and Broadcast Production 3 (2-3) Prereq Com 225.
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 V 9-12 By interview only. Credit not granted for both Bdcs 395 and 495.
499 Special Problems V 1-4 May be repeated for credit.
<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Journalism</strong></td>
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<tr>
<td>305 Jour</td>
<td>Reporting 3 Prereq Com 225.</td>
</tr>
<tr>
<td>325 Jour</td>
<td>Specialized Reporting 3 Prereq Jour 305.</td>
</tr>
<tr>
<td>330 Jour</td>
<td>News Editing 3 (2-3) Prereq Jour 305.</td>
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<tr>
<td>395 Jour</td>
<td>Journalism Practicum V 1-6 By application only. Credit not granted for both Jour 395 and 495.</td>
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<tr>
<td>425 Jour</td>
<td>Reporting of Public Affairs 3 Prereq Jour 325, 330. For seniors and graduate students.</td>
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<tr>
<td>430 Jour</td>
<td>Critical Writing 2</td>
</tr>
<tr>
<td>475 Jour</td>
<td>Seminar in Journalism 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.</td>
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<tr>
<td>495 Jour</td>
<td>Professional Internship V 9-12 By interview only. Credit not granted for both Jour 395 and 495.</td>
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<tr>
<td>499 Jour</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
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<tr>
<td><strong>Public Relations</strong></td>
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<tr>
<td>312 P R</td>
<td>Public Relations 3 Prereq Com 225.</td>
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<tr>
<td>313 P R</td>
<td>Public Relations Writing and Editing 3 (2-3) Prereq Jour 305; P R 312.</td>
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<tr>
<td>395 P R</td>
<td>Public Relations Practicum V 1-6 By application only. Credit not granted for both P R 395 and 495.</td>
</tr>
<tr>
<td>413 P R</td>
<td>Public Information 3 Prereq P R 312. For seniors and graduate students.</td>
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<tr>
<td>475 P R</td>
<td>Seminar in Public Relations 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.</td>
</tr>
<tr>
<td>495 P R</td>
<td>Professional Internship V 9-12 By interview only. Credit not granted for both P R 395 and 495.</td>
</tr>
<tr>
<td>499 P R</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
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<tr>
<td><strong>Speech Communication</strong></td>
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<tr>
<td>101 SpCom</td>
<td>Principles of Interpersonal Communication 3 Theory and practice of interpersonal communication; understanding and applying intrapersonal information in interpersonal settings.</td>
</tr>
<tr>
<td>200 SpCom</td>
<td>Speech Communication K-12 3 The application of speech communication to the teacher and to teaching methods in grades K through 12.</td>
</tr>
<tr>
<td>235 SpCom</td>
<td>Principles of Group Communication 3 (2-3) Theoretical and practical aspects of communication in groups; classroom exercises and films demonstrate theoretical principles.</td>
</tr>
<tr>
<td>251 SpCom</td>
<td>(250) Oral Interpretation of Literature 3 Analyzing and oral reading of prose, poetry, and drama; sharing literature with an audience.</td>
</tr>
<tr>
<td>301 SpCom</td>
<td>Advanced Principles of Interpersonal Communication 3 Prereq SpCom 101. Theoretical literature relevant to analyzing relationships; students use this information to analyze a relationship.</td>
</tr>
<tr>
<td>302 SpCom</td>
<td>[C] Advanced Public Speaking 3 Advanced principles of public speaking and their practical implementation for effective communication.</td>
</tr>
<tr>
<td>330 SpCom</td>
<td>[C] Argumentation 3 (2-3) Theory and analysis of the types of arguments in everyday use.</td>
</tr>
<tr>
<td>331 SpCom</td>
<td>Deliberative Decision-Making 3 Debate; researching the topic, case construction, analysis, and practice debating.</td>
</tr>
<tr>
<td>351 SpCom</td>
<td>Advanced Interpretation 3 Voice and diction, interpretation of copy for broadcast.</td>
</tr>
<tr>
<td>395 SpCom</td>
<td>Speech Communication Practicum V 1-6 By application only. Prereq SpCom 400. Credit not granted for both SpCom 395 and 495.</td>
</tr>
<tr>
<td>400 SpCom</td>
<td>Application of Communication Theory 3 Extant communication theory; its application in an occupational setting.</td>
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<tr>
<td>401 SpCom</td>
<td>Persuasion 3 Theory and practice of persuasive speaking.</td>
</tr>
<tr>
<td>405 SpCom</td>
<td>Applied Interpersonal Communication 3 Prereq SpCom 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.</td>
</tr>
<tr>
<td>415 SpCom</td>
<td>Structure of Conversation 3 Verbal and nonverbal symbol systems and their interrelation in communication.</td>
</tr>
<tr>
<td>425 SpCom</td>
<td>History and Criticism of Public Address 3 Critical analysis of the rhetoric of movements, campaigns, and significant speakers.</td>
</tr>
<tr>
<td>435 SpCom</td>
<td>Speech Pedagogy 3 Prereq 8 hrs SpCom. Principles, history, philosophies, and methods of speech education; objectives, materials, and procedures in directing class and cocurricular activities</td>
</tr>
</tbody>
</table>
| 495 SpCom    | Professional Internship V 9-12 By interview only. Prereq SpCom 400. Credit
not granted for both SpCom 395 and 495.

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

504 Instructional Practicum I May be repeated for credit; cumulative maximum 4 hours.

513 Seminar in American Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as Hist 513 and Engl 513.

516 Interpersonal and Small Group Communication 3 Theory and research in interpersonal and small group communication. (a/y)

525 Rhetorical Theory and Criticism 3 Significant theories of rhetoric and rhetorical criticism from Plato and Aristotle to Kenneth Burke.

535 Seminar in Speech Education 3 May be repeated for credit; cumulative maximum 6 hours. Research in current problems in the area of speech education.

539 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 Com 225, (2) C grade in two of the following three introductory courses: Com 101, 245, 270, (3) 2.7 cumulative g.p.a. in communications courses, (4) 2.5 cumulative g.p.a. in all courses. 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 Bachelor of Arts degree 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 36 semester hours in Communications.

Advertising

Issues/Institutions/Organizations (6 hours): Adver 280 plus one of Com 410, 415, 440, or 450. Pre-Professional (9 hours): Adver 380, 382, 480. Theory (6 hours): Adver 475 plus one of Com 373, 460, 470, 490. Enrichment (6 hours): Adver 395 or 495 or 6 hours upper-division communications courses; Mktg 360.

Broadcasting

Pre-Professional (9 hours): Bdcst 255 plus 365 and 465, or 355 and 455. Issues/Institutions/Organizations (6 hours): Com 415 plus one of Com 410, 420, 440, 450, or 481. Theory (6 hours) Bdcst 475, Com 373, 460, 470, or 490. Enrichment (6 hours): Bdcst 395 or 495 or 6 hours upper-division communications courses.

General Communications

At least 36 hours in communications, advertising, broadcasting, journalism, public relations, or speech communication is worked out by the student and the department chairperson prior to certification of major in this sequence.

Journalism

Pre-Professional (9 hours: Jour 305, 330, 425. Issues/Institutions/Organizations (6 hours): Com 415 plus one of Com 410, 420, 440, or 450. Theory (6 hours): Jour 475 plus one of Com 373, 460, 470, or 490. Enrichment (6 hours): Com 253, Jour 395, 495, or 430, or 6 hours upper-division communications courses.

Public Relations

Pre-Professional (9 hours): P R 312, 313, and Jour 305. Issues/Institutions/Organizations (6 hours): P R 413 plus one of Com 410, 415, 420, 440, or 450. Theory (6 hours): P R 475 plus one of Com 373, 460, 470, or 490. Enrichment (6 hours): P R 395 or 495 or 6 hours upper-division communications courses; Mktg 360.

Speech Communication

Pre-Professional: 3 hours from SpCom 101, 235 or 405; 3 hours from SpCom 251, 302, or 351; 3 hours from SpCom 330 or 331. Issues/Institutions/Organizations (6 hours): SpCom 400, 425. Theory (6 hours): SpCom 301, 401, or 415. Enrichment (6 hours): SpCom 495 or 6 hours upper-division communications courses.
DEPARTMENTAL MINORS

Students declaring a minor in communications must choose one of the following sequences and complete a minimum of 18 hours, including 9 upper-division hours and the following required courses: Advertising Minor: Com 225; Adver 280, 380, 382. Broadcasting: Com 225, Bcst 255; Com 415, Bcst 475. Journalism: Com 225, Jour 305, 330, 425; Com 410, 415. Public Relations: Com 225, Jour 305; P R 312, 313, 413. Speech Communications: 18 hours of approved SpCom courses.

AGRICULTURAL COMMUNICATIONS

This is a major in the College of Agriculture and Home Economics in cooperation with the Department of Communications. The student declaring this major must complete the requirements of the general agricultural curriculum and accumulate a minimum of 30 hours in the Department of Communications, including any communications courses used to satisfy general agricultural requirements. Those electing this major should make that decision as early as possible in their academic careers. Agricultural communications majors should complete the following: Print Media: Com 225; Jour 305; Com 253; P R 312, 313, 413; Com 490 and 9 elective hours in the Department of Communications. Broadcast Media: Com 225, Bcst 255, 355, 365; P R 312, 313, 413; Com 490, and 6 elective hours in the Department of Communications. 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.

TEACHER TRAINING

Students preparing to teach should consult the catalog listing of the Department of Education for certification requirements. Students majoring or minorining in communications for purposes 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

Associate Professor and Department Chair, A. Kuo; Professor, W. Willard; Associate Professors, T. Anderson, F. Padilla; Assistant Professors, F. Garcia, G. Nomura, J. Peterson, E. Smith, S. Sumida; Instructor, D. Culverson.

The Department of Comparative American Cultures offers courses of study in Asian American Studies, Black Studies, Chicano Studies, and Native American Studies (see alpha listing).

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 credit hours in Black Studies have been approved as a minimum requirement for a minor 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.

Department of Computer Science

Professor and Acting Chair, C. B. Millham; Professors, D. B. Benson, N. Deo, G. Marsiglia, R. A. Parker, K. C. Wang; Associate Professors, A. C. Genz, C. E. Kim, R. E. Lord; Assistant Professors, M. A. Langston; Visiting Professor, J. Tiurny; Visiting Assistant Professor, G. P. Gupta; Program Coordinator at JCGS, D. J. Lynch; Adjunct Associate Pro-
jessors, D. J. Fraley, J. R. Kosorok; Adjunct Assistant Professors, L. G. Niccoli, J. J. Thomas; Adjunct Lecturers, A. Dodd, K. Eckblaw, T. J. Mathieu, R. Melton, T. A. Seim, W. E. Wilson.

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 V6 and V8. The department owns an HP 3000 Series 68, an HP 9000, a VAX 11/750, a Ridge 32, many LSI-based systems and other microcomputers, a Tektronix 4115B graphics system, a DeAnza graphic/Imaging system and 2 eight pen color plotters.

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 Concepts of Computer Science 3 Prereq Math 107 or c//. Foundations of computer science and computation; capabilities and uses of computers.

150 Computer Program Design and Development 2 Prereq Math 107; c// in Cpt S 151, 153, 154, or 241. Formulation of problems and the top-down design of procedures for their solution on a digital computer; structured programming methodology.

151 FORTRAN Programming 2 Prereq Cpt S 150 or c//; Math 171 or 202.

Comprehensive programming practice using FORTRAN.

153 BASIC Programming 2 Prereq Cpt S 150 or c/. Comprehensive programming practice using BASIC.

154 PASCAL Programming 2 Prereq Cpt S 150 or c/. Comprehensive programming using PASCAL.


240 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, 153, and 154; or different programming language.

241 (152) COBOL Programming 2 Prereq Cpt S 150 or c/. Comprehensive programming practice using COBOL.

250 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 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 Principles of Optimization 3 Same as Math 364.

350 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 data base systems.

360 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 Systems Analysis and Design 3 Prereq Cpt S 150 or 154. Analysis and design of computer-based systems typically found in a business environment; related program projects.

405 The Use of Computer Systems 3 For non-majors. 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 Fundamentals of Digital Systems 3 Same as E E 414.

422 Software Development 3 Prereq Cpt S 250, 316. Large scale software development; requirements analysis, estimation, design, verification techniques.

423 Software Development Laboratory 3 (1-6) Prereq Cpt S 350, 422; Eng 402 or CSE 472. Programming team principles; software development in small teams.

430 Numerical Analysis 3 Same as Math 448.

432 Introduction to Simulation 3 Same as OMath 417.

435 Computer Methods in Probability and Statistics 3 Prereq Cpt S 150, 151; Math 172, 220; one Stat course. Extensive use of computers to generate random variables and use them to illustrate, develop, and expand results in probability/statistics.

442 Computer Graphics 3 Prereq Cpt S 350; Math 220. 2-D and 3-D object manipulation and representation.

450 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.

452 Compiler Design 3 Prereq Cpt S 316, 350. Design of lexical analyzers, syntactic analyzers, intermediate code generators, code optimizers and object code generators.

453 Graph Theory 3 Same as Math 450.

455 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 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 Microcomputer Systems and Programming 3 (2-3) Prereq Cpt S 360; E E 214; Cpt S major. Microcomputer systems architectures; microcomputer software; laboratory practice in programming microcomputers.

490 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.

495 Consulting in Computer Programming 1 May be repeated for credit; cumulative maximum 2 hours. Prereq Cpt S 151, 153, or 154; Cpt S 250, 260; Cpt S major. Consulting for students in Cpt S 151, 153, 154, 250, and 260.

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

516 Theory of Computing 3 Prereq Cpt S 316. Discrete structures, automata, formal languages, recursive functions, theory of algorithms and computability.

517 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.

518 Programming Language Theory 3 Prereq Cpt S 516 or Math 421. Syntax; operational and denotational semantics.

522 (550) Verification 3 Prereq Cpt S 422, 516. Proofs of programs; logics of programs; formal specification techniques.

531 Computational Linear Algebra 3 Same as Math 544.

532 Advanced Numerical Analysis 3 Same as Math 545.

535 Topics in Optimization 3 Same as Math 564.

536 Modeling and Simulation of Ecological Systems 3

541 Artificial Intelligence 3 Intelligent computer programs; simulation of cognitive processes.

542 Advanced Graphics 3 Prereq Cpt S 442.
Solid modelling, visual realism, light and color models, advanced surface generation techniques.

551 Database Systems 3 Prereq Cpt S 316. Data models: file organization and search; database system design.

552 Theory of Compiling 3 Prereq Cpt S 452, 516. Concepts and techniques of parsing; code generation and optimization; automatic compiler construction; error detection and recovery.

560 Operating Systems 3 Prereq Cpt S 460. Structure of multiprogramming and multiprocessing; efficient allocation of systems resources; design implementation and performance measurement.

561 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.

580 Advanced Topics in Computer Science 3 May be repeated for credit.

596 Operating Systems Seminar 1

597 Parallel Processing Seminar 1 May be repeated for credit; cumulative maximum 3 hours.

598 Computer Science Seminar 1 May be repeated for credit; cumulative maximum 3 hours.

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.

**Course Numbering**

The numbering scheme of computer science courses indicates areas of specialization which may be of interest to students. The scheme applies to numbers less than 600. The last two digits of each course number specify this area of specialization: 00-09 indicate service courses; 10-19 indicate courses on the theoretical foundations of computer science; 20-29 indicate courses in engineering aspects of computer science; 30-39 indicate courses in applied numerical computing; 40-49 indicate computer science courses in diverse application areas; 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 indicate topics courses; and 90-99 indicate special projects, internships, and seminars.

**CERTIFICATION REQUIREMENTS**

To work towards the Bachelor of Science 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 last Friday of classes of the current 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 one of Stat 430, 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 advisor. 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 of practical work experience (a summer plus one full semester) 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 have an overall g.p.a. of 3.00 or higher, and 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 courses 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.

**Assistant Professors, T. C. Castellano, M. Mathews.**

The Criminal Justice Program (administratively located in the Department of Political Science) offers a liberal arts education in conjunction with professional studies in the field of criminal justice. The program prepares students to compete for a broad range of careers (law enforcement, corrections, juvenile justice), educates them for pursuit of graduate study, develops leadership qualities, and promotes the ideal of professional achievement in public service.

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 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 curriculum 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. Cooperative course taught at the University of Idaho (CJ ID 325).


375 The Philosopher and the Humanist: Their Impact on the Criminal Justice System 3 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 May be repeated for credit; cumulative maximum 6 hours. 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, 320. 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, 320. 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 1-12 May be repeated for credit; cumulative maximum 12 hours. Prereq major in Crm J. By interview only. Off-campus professional internship in selected criminal justice agencies.

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

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 Criminal Justice: Process and Institutions 3 Process of criminal justice in the context of the social, political, and economic environments.

535 Reform Models for Criminal Law 3 Overreach of the criminal law, proposals for reform in the process of law, legal research.

540 Proseminar in Criminal Justice Intervention 3 Various models of criminal justice intervention with criminal and delinquent offenders; institutionalized intervention, diversion and community based programming.

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.

591 (500) Seminar in the Administration of Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice.

592 Topics in Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Policy formation, administrative-management, evaluation research developments.

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.

**Freshman Year**
- Crm J 101
- Eng 101* 3
- Science (physical or biological, lab) * 4
- Psych 102* 3
- Communication GUR 3
- Soc 101* 3
- Pol S 101* 3
- Humanities GUR 3
- Electives 5

**Sophomore Year**
- Crm J 150 3
- Phil 101 3
- Foreign Language * 8
- Science (physical or biological, lab) * 8
- Electives 8

**Junior Year**
- Crm J 320 3
- Crm J Electives 6
- Soc 320 3
- Soc 361 3
- Pol S 300, 402, 404; Soc 364 6
- Minorities Studies * 3
- Electives 6

**Senior Year**
- Crm J 470 3
- Crm J Electives 6
- Pol S 416 3
- Pol S 440 3
- Soc 461 3
- Electives 12

Student should review the GURs and College of Sciences and Arts requirements in this bulletin to insure timely competition of their course of study.

*Course fulfills a General University Requirement.

**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.

**Department of Economics**


The curriculum in economics is designed to serve all students interested in the study of economic relationships in the national and world economy. 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 "Symbol." 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.


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.

302 Intermediate Microeconomic Theory 3 Prereq Econ 203 or 201; Math 171 or 202. Microeconomic theory using calculus, or majors in Econ and Ag Ec.

311 Introductory Econometrics 3 Prereq QMeth 215, Econ 102, 203. Methods of empirical analysis in the context of actual forecasting problems, use of the computer in forecasting.

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 Prereq 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 of public finance and administration 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.

401 Intermediate Macroeconomic Analysis 3 Prereq Econ 320; Math 171 or 202. 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 or 302; Math 171, 172. Neoclassical economics and related subjects using the calculus as the primary analytical tool.

411 Introduction to Econometrics 3 Prereq Econ 301 or 302. 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 302, 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
Department of Economics

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.


460 Concentration of Corporate Power and Antitrust Policy 3 Prereq Econ 301 or 302 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, 302, or 364; QMeth 215 or 311. 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 301, 302, or 364; QMeth 215 or Econ 311. Analysis of 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 301 or 302. 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 or 302, and 102 or 201. Analysis and description of international specialization; commercial policy; multinational firms, monetary problems.

472 Economic Development and Underdevelopment 3 Prereq Econ 301 or 302, and 102 or 201. Development theories, policies, and performance of Third World economies; population, land reform, foreign trade, aid, investment, debt, dependency.

481 Economics of Environmental Issues 3

Prereq Econ 301 or 302. Economy—environmental interactions; efficient allocation of environmental resources; market failure and environmental degradation; economic analysis of environmental policies.

482 (581) Energy Economics 3 Prereq Econ 301 or 302. Analytical and institutional treatment of energy production and pricing, economic and environmental effects of energy use; U.S. energy policy formation and Northwest energy issues.

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

500 Macroeconomic Analysis 3 Prereq Econ 401, 408 or one year calculus and c/ in Econ 408. General equilibrium theories of inflation and unemployment; consumption, investment and money demand functions; monetary and fiscal policy.

501 Microeconomic Theory 3 Prereq Econ 301 or 302, 408 or one year calculus and c/ in Econ 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.


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-level students with limited training in microeconomics. The use of economic theory and quantitative analysis for business decisions and policy analysis.

510 Mathematical Models of Economics 3 May be repeated for credit; cumulative maximum of 6 hours. Prereq Econ 503. Exposition of the mathematical structure of economic theories; the unity of mathematical theorems underlying modern developments.

511 Econometrics 3 Prereq Ag E 510 or Stat 443; Econ 411; Math 420. 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 511, 500, or 501; Stat 444. Executing empirical research: advanced empirical methods and analysis of panel data or time series data.

520 Seminar in Monetary Economics 3 Prereq Econ 420, 500. 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. Prereq Econ 500, 501, 411. 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 503. Positive and normative tax theory; discounting and public investment; externality; decreasing cost industries and public production; public goods.

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 and Urban Economic Analysis 3 Prereq Econ 501, 411. Advanced freight transportation; cost, production, demand, and network analysis or urban transportation models and related issues.

568 Public Utility Theory and Policy 3 Prereq Econ 501.

570 International Economics 3 Prereq Econ 470, 500. 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 Prereq Econ 470, 500. 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 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 500. 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; 502; 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

1May not be used as GUR courses.

TRANSPORTATION OPTION
The transportation option of the baccalaureate program in economics emphasizes the
foundations of economic analysis and decision-making in transportation. The curriculum is useful to students who are considering careers in either the public or private sector of transportation or are planning to do graduate study. The option is designed around a variety of areas to provide the student with skills and training in economic analysis, transportation economics, mathematics, and quantitative methods, and business administration.

**General University Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Arts and Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Communication Proficiency</td>
<td>6</td>
</tr>
<tr>
<td>Sciences</td>
<td>10</td>
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</tbody>
</table>

**Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 102 and 203 Prin Econ</td>
<td>6</td>
</tr>
<tr>
<td>Econ 301 or 302 Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 320, 401 Macroeconomics</td>
<td>6</td>
</tr>
<tr>
<td>Econ 430, 431, or 402</td>
<td>3</td>
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</table>

**Field Courses**

Upper-division Econ courses with at least 6 hours at the 400 level: 12

**Transportation Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 364 Transport Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 463 or 464</td>
<td>3</td>
</tr>
</tbody>
</table>

**Mathematics**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Math 220 or 201 Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math 171 or 202 Calculus</td>
<td>3</td>
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</tbody>
</table>

**Quantitative Methods**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>QMeth 215 Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Econ 311 Econometrics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Related Work**

12 hours from QMeth 344, C E 322, 424, Acctg 230, Mgt 301, Mktr 360, 462, Fin 325: 12

**Project**

Econ 499 (transportation project) or professional internship: 3

Electives: 38

**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. 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:** Acctg 230; Pol S 300; and, depending on legal interests, elective Econ courses from the following: Econ 340, 364, 450, 451, 460, 468, 470, 481, 482; B Law 410, 411 suggested.

**Business School:** Acctg 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, Acctg 233, and to take introductory courses in the major areas of business: B Law 210, Mktr 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.

**Public Administration:** Acctg 230 and Pol S 440; Pol S 443, 446 and Cpt S 201, 210 or 220 recommended. Electives: Econ 316, 340, and 440.

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, 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. Applicants must have a cumulative g.p.a. of at least 2.50 and score at the 40th percentile or above in the reading, writing, and mathematics components of the Pre-professional Skills Test.

3. Admission or continuing enrollment may be denied an education major on the basis of review by the department.

4. Applicants for the Initial 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 Continuing 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**

**Initial Certificates—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 an Initial 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 four years. The initial certificate 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 and home economics education are referred to the General Agriculture and Home Economics section of this bulletin for their certification requirements.

Application for issuance of an Initial Certificate should be submitted to the Department of Education within six months of the completion of the student's senior year.

**Continuing Certificate and the Fifth Year of Preparation**

 Experienced teachers may be recommended by Washington State University to the State Superintendent of Public Instruction for the
Continuing Certificate. Candidates for the certificate shall meet specific requirements dependent upon their present certificate status. The Continuing Certificate is valid as long as the individual remains in the teaching profession and for a period of seven years thereafter.

Holders of the Initial Certificate may be recommended for a Continuing Certificate upon completion of three years of successful teaching experience and an approved five-year college program of studies (30 semester hours). 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 note-taking, 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 Initial Certificate.

**Course of Study**
The State Board of Education has established guidelines and standards for teacher-preparation programs. All Initial Certificates recommended by the Department of Education of Washington State University meet these standards.

The Initial Certificate is limited as to grade level and subject-matter preparation for the first four years 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 a week practicum in a public school (usually in January) and attends orientation lectures. Arrangements are made for this experience with the Director of Teacher Education.

2. In Educ 303, 305, and 320 all students participate in required directed observations in public school classrooms one-half day per week. Special Education majors are required to participate in six hours per week of practicum in a Special Education classroom in a public school in conjunction with both Sp Ed 401 and 402.

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 Initial 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 200 and 300.

2. Professional Education and Professionalized Subject-Matter Minor: 44 hours

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Educ 300 Intro Field Trip</td>
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<tr>
<td>Educ 301 Educ Psych</td>
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<tr>
<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 Rdng and LA</td>
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<td>Educ 307 Sur Chil Lit</td>
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<td>Educ 320 El Read Meth</td>
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<td>*Educ 390 Elem Art Ed</td>
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<td>Educ 401 Eval Rdng El</td>
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<td>Educ 403 or 404 Curriculum</td>
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<tr>
<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 advisor in the Department of Education.

*Required professionalized subject-matter minor courses.

#### Junior High School Preparation

1. General Education: approximately 45 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

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<tr>
<td>Educ 300 Intro Field Exp</td>
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<td>Educ 301 Educ 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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<tr>
<td>Educ 402 Eval Rdng Sec</td>
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<tr>
<td>Educ 403 or 404 Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>Educ 405 or 406 Dir Teaching</td>
<td>10</td>
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</tbody>
</table>

3. Subject-Matter Preparation: approximately 48 hours. The student will select a teaching major of approximately 30 semester hours and a teaching minor of approximately 16-21 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, 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 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

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<tr>
<td>Educ 405 or 406 Dir Teaching</td>
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</tbody>
</table>

3. Subject-Matter Preparation: approximately 48 hours. The student will select a teaching major of approximately 30 hours and a teaching minor of approximately 16-21 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

| Education courses may be taken by certified Elementary or Secondary Education majors only. |

For explanation see Index under “Symbols”

Educ 100 Reading Efficiency and Study Skills Strategies to augment such student capabilities as vocabulary, comprehension rate flexibility, note-taking, test-taking, and study skills.

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 teaching; observation to be scheduled in a 3-hour block once a week.

304 Elementary Mathematics, Science, Social Studies I 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 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.

307 Survey of Children’s Literature 3 Prereq Educ 301. Types, values, selection of children’s literature; role of teacher in facilitating children’s experiences with books.

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.


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 Bicultural Education 3 Same as Ch St 335.
358/359 Communication, Cultures, and Careers 2 Prereq Educ 303. Social, psychological multicultural issues: human relations, ethnic concerns, sexism, career education; teaching responsibilities.
389 Elementary School Art Education 2 (1-3) Prereq Educ 301. Creative methods for utilizing art media in the elementary classroom.
401 Evaluation of Learning, Elementary 2 Prereq Educ 305 or 320. Theory and methods of evaluating pupil progress in the elementary schools.
403/404 Social Foundations of Curriculum 3 Prereq Educ 303 or 320; c// in directed teaching. Public school curriculum.
405/406 Directed Teaching V 8 (1-24) 12 (1-35) May be repeated for credit. Prereq Educ 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.
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 and Materials Across Content Areas Prereq Educ/Ch St 335. Approaches, methods, and materials across content areas for the bilingual classroom.
422 Public Administration and Program Management in Developing Countries 3 Same as Ag Ec 422.
430/431 Innovations in Reading 2 Prereq Educ 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 430/431 and 530/531.
432/433 Children's Literature in the Curriculum 2 Prereq Educ 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 Educ 432/433 and 532/533.
434/435 Introduction to Guidance 2 or 3 Prereq 12 hrs Educ, Guidance: history, philosophy and services. Credit not granted for both Educ 434/435 and 534/535.
445/446 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.
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.
450/451 Teaching Reading in the Content Areas 2 Prereq Educ 303 or c//, or Educ 306 or c//. Development of reading and study skills; demands of various content areas and implementation.
452 Content Area Reading and Study Skills Practicum V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq Educ 320 or 450. Development and delivery of vocabulary, comprehension, and study skills under supervision of Reading Center staff.
455 Educational Uses of Microcomputers 2 or 3 Prereq Educ 303 or 304. Types and functions of educational software, evaluation criteria, designing instructional programs and classroom considerations.
462/463 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.
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.
485/486 Social Studies in the Contemporary School 2 Prereq junior standing. Bases, scope, and sequence of the social studies curriculum; problem analysis of timely issues.
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 Bl St 491.

492 Designing Art Programs for the Public Schools 3 Prereq Edu 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.

497 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

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

501 Philosophy of Education 3 Development of American educational philosophy.

502 Advanced Educational Psychology 3 Prereq Edu 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 Edu 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 Edu 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 Edu 303 or 307 or teaching experience. Elements and forms of poetry for children and young people; selection and utilization in the school curriculum. (a/y)


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, specialized personnel, principals, and superintendents with responsibility for in-service programs; practices and procedures in in-service education.

518 Educational Technology 3 Prereq Edu 445 or 446. Relates research and theory of communication to instructional resources and current educational technology; problems of planning and administering programs.

519 Practicum 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 V 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 V 1-4 May be repeated for credit; cumulative maximum 6 hours.
Department of Education

523 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours.

524 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours.

525 Foundations of Community Education 3 History, purposes, basic concepts underlying contemporary community education programs.

526 Education Resources for Community 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. (SS)

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. (SS)

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 434; additional requirements. Credit not granted for both Educ 434 and 534.

535 Introduction to Guidance 2 or 3 Same as Educ 534. Graduate level counterpart of Educ 435; additional requirements. Credit not granted for both Educ 435 and 535.

539 Innovations in Language Arts 2 or 3 Prereq Educ 303 or 320 or teaching experience. The most recent developments in language arts instruction for pre-service and in-service teachers K-12. (SS)

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 experience. Classroom experiences and materials for helping children understand number properties and operations; research findings related to instruction.

544 Advanced Children's Literature 3 Prereq Educ 307; teaching experience. Trends, issues, and research in children's literature.

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 Educ 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. (SS)

548 Early Childhood Language Arts 3 (2-3) Prereq Educ 306, Sp 571, 6 hrs CFS, or teaching experience. Cultural and developmental factors in language learning and early childhood language arts programs.

550 Research in Reading 2 or 3 Prereq Educ 320; teaching experience. Research applied to pertinent classroom problems in the teaching of reading.

551 Psychology of Reading 2 Prereq Educ 320 or 450/451; teaching experience. Psychological, perceptual, motivational, developmental, and physiological aspects of reading. (a/y)

552 College Reading Practicum V 1-0 May be repeated for credit; cumulative maximum 3 hours. Prereq
Advanced Educational Statistics 3 Prereq Educ 508. Applications of inferential statistics in educational research and evaluation.

Evaluation Techniques 3 Prereq Educ 509. Theory of scaling; development of techniques for appraising attitudes, interests, and appreciation.

Program Evaluation 3 Prereq Educ 509. Strategies and techniques for evaluation of educational programs.

Methods of Research and Thesis Writing 3 Research methods and design; collection, analysis, and interpretation of data.

Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Educ 565. Application of parametric and non-parametric statistics, data processing using computer packages in educational research.

The Community and Junior College 3 For teachers and administrators. Development and function of the junior community college.

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.

The American College and University 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

Issues in Higher Education 3 Selected contemporary issues in higher education.

Seminar in Higher Education 2 May be repeated for credit; cumulative maximum 6 hours.

Continuing and Adult Education 3 Development and scope of continuing/adult education; basic concepts of administration, teaching, and curriculum development.

School Organization and Administration 2 or 3 Prereq teaching experience. Readings and discussions on the theories and practices of school organization and administration.

Policy Formation in Education 3 Prereq Educ 580. Policy formation and political aspects of administration; collective bargaining, voter behavior, bonds, ballots, resolutions of conflicts.

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 Management of Facility Planning 3 Principles and procedures in the development of educational specifications, conducting needs assessment, forecasting; selecting an architect.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. 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 (0-0) May be repeated for credit; cumulative maximum 6 hours. Prereq Educ 592, 593. By interview only. Supervised experience.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation and production of grant proposal. (SS)

597 Counseling Psychology Internship V 3-9 May be repeated for credit; cumulative maximum 18 hours. Prereq Educ 557, 558, 559, 562, 592, 594. Supervised field experience; one-to-one and group counseling, evaluation, assessment, staff meeting, teaching.

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.

Special Education
Sp Ed

301 (Educ 455) Education of Exceptional Children 3 Classification, developmental characteristics, and etiology of exceptional children: research and methods of instruction in the classroom.

401 (Educ 446) Analysis and Management of Exceptional Behavior 3 (2-3) Prereq Educ 301; Sp Ed 301. Intervention strategies and continuous progress measurement systems for dealing with academic, social problems in education settings.

402 Curriculum Modification and Development in Special Education 3 Prereq Sp Ed 301, 401; Psych 390. Concepts and techniques for developing, adapting, and evaluating curriculum for students with handicaps.

403 (Educ 481) Methods in Secondary Special Education 3 Prereq Sp Ed 301, 401; Psych 390. Techniques, strategies, and curriculum for working with secondary-aged and adult individuals with handicaps.

404 Professional Skills in Special Education 2 Prereq Sp Ed 301; Psych 390. Communication, problem solving, liability, record keeping, professional development, program evaluation.
Schedule of Studies

Students planning to complete a program in education must follow the requirements for the Initial Certificate for the appropriate level, elementary, junior high or high school preparation, are 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 the junior year. Written application for directed teaching must be made by mid-December 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 required with specific courses required depending upon the option selected. See Agricultural Education program listed under the Department of General Agriculture and Home Economics. 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 Agriculture.

Bilingual-Bicultural Education (Spanish-English)

Elementary School Major: 34 hours

Bilingual Methodology: Educ 335, 411, plus two blocks of student teaching (Educ 405 and 406). One block of student teaching will be conducted in a bilingual-bicultural classroom. Culture and History: Ch St 220, 272, 313, 372, 375. Language and Linguistics: Ch St 329. Candidates must pass a Spanish language proficiency examination before teacher certification.

Biological Science


Senior High School Minor: 20 hours

A course in introductory biology, GenCB 301, Bio S 372, 430, and additional hours from bacteriology, botany, genetics, and cell biology, and zoology, to include one course in physiology.

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 120, 332, 430, Zool 224 and 225. Plus additional electives from the preceding fields or the following: Bact 101 or 201; Bot 411, 460, 462; Entom 340, 343, 441; GenCB 430, 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 120, 332, Zool 224 and 225.

Chemistry

Senior High School Major: 30 hours

Chem 105, 106, and 107, or 115, 116, and
117; 220 and 222; Hist 381 or 382, plus additional hours from 300- and 400-level chemistry courses. Required Minor: Bio S 430; at least 15 hours of mathematics and physics including either Phys 101, 102, or 201, 202, and Math 108. 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: 30 hours

Communications
Senior High School Major: 36 hours
(An approved teaching minor is required with this major.)

Journalism: Students will be certified as majors if they earn a 2.7 g.p.a. in the following core courses and have a 2.5 cumulative g.p.a.: Com 225, and two of Com 101, 245, or 270. Upon certification, these requirements will be met: Pre-Professional: 9 hours—Jour 305, 330, and 425. Issues/Institutions/Organizations: 6 hours—Com 415 plus one of the following: Com 410, 420, 430 or 450. Theory: 6 hours—Jour 475 plus one of the following: Com 373, 460, 470, or 490. Enrichment: 6 hours—Com 253, Jour 395, 430, or 495, or six upper-division hours in mass communications sequence.

General Communications: Students will be certified as majors if they complete the core courses listed under journalism above and have the 2.7 and 2.5 grade point averages. Students must obtain approval of a course of study of 27 hours in the pre-professional, issues/institutions/organizations, theory, and enrichment categories by filling a program with the Communications chairperson and the coordinator of Student Personnel Services in the Department of Education.

In addition to meeting these departmental requirements students seeking a BA in Communications will meet the graduation requirements of the College of Sciences and Arts and complete a minimum of 81 hours outside the Department of Communications.

Speech Communication: Students will be certified as majors if they have a 2.5 cumulative g.p.a. and earn a 2.7 g.p.a. in the following core courses: Com 225 and two of Com 101, 245, or 270. Upon certification, these requirements will be met: SpCom 101 or 301; SpCom 102 or 302; 235; 251; 330 or 331; two courses from SpCom 401, 405, 415, 425; SpCom 435; Spe 260, 361.

Senior High School Minor: 18 hours
Students must complete the courses listed for one of the following sequences plus additional work in Communications to total 18 hours.

Advertising: Com 225, Adver 280, 380, 381; Broadcasting: Com 225, Bdcst 255, 365 or 355, and 475; Journalism: Com 225, Jour 305, 330, 425, Com 410 and 415; Public Relations: Com 225, Jour 305, P R 312, 313, 413. Elective courses are to be approved with an adviser in the Department of Communications. Speech Communication: SpCom 251 or 351; 435; one course from SpCom 101, 235, 301, 405; 102 or 302; 330 or 331; Com 245, Spe 260, 361 are recommended.

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; 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 150, 151, or 153, or 154. Required Minors:
Physical Science: Phys 101, 102; Chem 101
and 102, or 105 and 106 and 107, 240; Math
107 and 171, or 140 and 141.

**Biological Sciences:** 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
303, 444, 493 (2 hrs); Bio S 103, 104,
474; Geol 101 or 102 or 104; 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 101, 103, 110, 111, 201, 202, 320, 331,
340, 350, 360, 370, 389, 498, Eduç 492
plus 9 hours of electives in fine arts selected
in consultation with a fine arts adviser. No
minor is required with this major. If the above
requirements plus the requirements for gradu-
ation of the College of Sciences and Arts are
met, the degree will be Bachelor of Arts in
Fine Arts.

**Senior High School Minor:** 24 hours
F A 101, 103, 110, 111, 303, 320, 350, 389.
Eduç 492 is recommended.

**Junior High School Major:** 33 hours
F A 101, 103, 110, 303, 320, 340, 350, 360,
370, 389, Eduç 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:** 24 hours
F A 101, 103, 110, 111, 303, 320, 350, 389.
Eduç 492 is recommended.

**Elementary School Major:** 31 hours
F A 101, 103, 110, 111, 303, 320, 340, 350,
389, Eduç 492 plus 3 hours upper-division
GUR.

**Foreign Languages and Literatures**

**Senior and Junior High School Majors:**
A minimum of 24 hours in one language be-
yond 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. Rec-
commended 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
work in that language in the freshman
year. For a teaching minor in a second lan-
guage 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 begin-
ing of the sophomore year. If the major and
minor course programs, the requirements for
the Initial Certificate, and the General Uni-
versity Requirements in the College of Sciences
and Arts are met, the degree will be a Bachelor
in Foreign Languages and Literatures.

**Senior and Junior High School Minor:**
A minimum of 8 hours in one language (be-
yond 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 420 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 (be-
yond 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, Hist 480, and one approved Comparative American Cultures course 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, 355; 450, 452 or 452; ID 101, C T 215, 216, 217; FSHN 120, 130, 266; electives to make 42 hours in home economics; AgHE 343; 345 or 346; 440 or 441; 434. Students completing the General University Requirements (including certain specified courses), the 42 hours of courses in home economics as outlined above, and the requirements for the Initial 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; ID 101; C T 217; FSHN 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; 257; 350; ID 101; C T 217; FSHN 120, 130.

Industrial Technology

Senior or Junior High School Major: 72 hours or 66 hours with an approved minor. Students enrolled in the 66-hour major will complete the following courses: I Tec 110, 220, 222, 322, 325, 333, 345, 348, 350, 426, 433, 440, 464, 471, 486, 488; Ag M 201, 313, 331, 416; ME 101, 102, or Arch 101, 210; Engl 402. Students wishing the 72-hour major will take I Tec 416 and 425 in addition to the above. Students taking the 66-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: 28 hours
I Tec 110, 222, 333, 348, 350, 426, 488; Ag M 201, 331; ME 101.

Language Arts

This consists of a major in English with a minor in communications or a major in communications with a minor in English; see under English and Communications.

Junior High School Major: 35 hours
Com 101; SpCom 251, 102 or 200 or 301; Spe 361; 364; Engl 323 or SpCom 455; 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 SpCom 301; SpCom 200 or Spe 205; SpCom 251.
Department of Education

Elementary School Major: 30 hours
Eng 210 or 246, 255 or 256, 301 or 302; Educ 308 or 309, 430 or 431; SPCOM 251, SPE 364, plus eight hours from:
SPCOM 301, SPE 371, SPEC 473; Eng 320, 335; Educ 411, 432, or 433, 443 or 446, 450, or 451, CFS 240.

Mathematics
(An approved teaching minor is required with this major.) All majors in mathematics must satisfy the graduation requirements of the College of Sciences and Arts.

Senior High School Major: 34 hours
Math 171, 172, 220, 273, 303, 315, 320, 330; Stat 360 or 443; Cpt S 150; Cpt S 153 or 154; plus one additional 3 hour mathematics course numbered above 300. If the necessary additional courses can be taken to fulfill the departmental requirements for graduation, the degree will be Bachelor of Science in Mathematics. If not, it will be Bachelor of Science in General Studies.

Junior High School Major: 29 hours
Math 171, 172, 220, 273, 303, 320, 330, Stat 360, or 443; Cpt S 150, Cpt S 153 or 154; plus one additional 3 hour mathematics course numbered above 300. If the necessary additional courses can be taken to fulfill the departmental requirements for graduation, the degree will be Mathematics. If not, it will 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 360 or 443; Cpt S 140.

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 require-
ments 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, 251, 252, 253, 254, 390, and 490, plus one course chosen from Mus 262, 265, 360, 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; FRS 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, 320, FSH 130, 170, GenCB 301, Geol 310, Phys 380, Zool 224 and 225, 251, 322 or 324.

Physical Education
Senior or Junior High School Major: 30 hours minimum
PEP 199, 261, 313, 362, 382, 463, 465, 482, 494; H Ed 363; PEP 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 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 education 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, PEACT 104, PEACT 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 Department of Physical Education.

Coaching: 21 hours
SpCom 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: FSHN 130, Env S 101 or equivalent community college course; CPS 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: Chem 101, 102, or 105, 106, 107, or 115, 116, 117; Geol 102; Math 171, 220, 230, 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, 435; BC/BP 471, 482; Chem 220, 222, 240, 331, 340, 341, 342, 343; Cpt S 150, 154, 260; Geol 310, 322, 340, 350, 402, 403; 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 Sciences in General Studies.

Senior High School Minor: 19 hours
Chem 101, 102, or 105, 106, 107, or 115, 116, 117; Bio S 430; Phys 101, 102, or 201, 202.

Junior High School Major: 36 hours
Chem 101, 102 or 105, 106, 107 or 115, 116, 117; Math 107 or 108, or 140; 171; 220; 320; Bio S 340; Phys 101, 102, or 201, 202; plus at least one course from Astr 135; Chem 220, 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 115, 116, 117; 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
Educ 308 or 309, 450 or 451, 430 or 431, 432 or 433, or 462, or 463; Spe 205, 371; Anth 250 or 450; plus 11 hours from Educ 411, 434, or 435, SpEd 401, Educ 553, SpCom 251, Spe 473, CPS 240, 440, Spe 364. 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 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 330, 343, 351, 362. Three upper-division approved courses from Anth, AASSt, 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 Major: none
Senior High School Minor: 18 hours
Soc 101, 102; Hist 422 or Pol S 206; and 9 hours from Soc 330, 340, 351, 362, 371, 373, 374, 410.

Special Education
Elementary School Major: 30 hours
Fifty clock hours of direct experience working with individuals with handicaps is required before certification as a special education major. SpeEd 301, 401, 402, 403, 404; Spe 371, 473; PEP 463, Psych 390, Educ 462, plus 3 hours selected from CFS 240, 440, 442, Educ 411, 430, 431, 434, 450, 490, 499; PEP 490; Psych 333, 360, 361, 464; RLS 464, Soc 362, SW 395, Spe 205, 281.

Speech
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 advisor in the Department of Speech rather than the Department of Education.

Theatre Arts and Drama: Spe 160; Drama 260; 263, 264, 361; SpCom 435; and 2 hours of Drama 396. (Major in English is recommended.)

Elementary School Major: None, see Language Arts.

Department of Electrical and Computer Engineering

A. A. Khan, A. Saberi; Adjunct Professors, W. R. McSpadden; Adjunct Associate Professor, J. W. Upton; Adjunct Assistant Professor, H. D. Collini.

The Department of Electrical and Computer Engineering offers courses of study leading to the degrees of Bachelor of Science in Electrical Engineering, Master of Science in Electrical Engineering, and Doctor of Philosophy. The department offers a schedule of studies in Electrical Engineering and in Computer Engineering, both leading to the degree of Bachelor of Science in Electrical Engineering. Students following either schedule of studies are expected to use main-frame computers, minicomputers, microcomputers, and microprocessor development tools to aid in their studies. The curriculum leading to the Bachelor of Science in Electrical Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

The curriculum in Electrical and Computer Engineering 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, power systems, electromagnetics, and computers are available.

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 and maximum flexibility is permitted in the senior year, allowing the student to develop a breadth of interest or pick an area of specialty. 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 and Computer 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 or its equivalent 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. Students should have essentially completed the equivalent of the first two years of the Schedule of Studies in either Electrical or Computer Engineering.

Applications for certification must be submitted prior to November 1 or April 1 for spring or fall semester certification respectively. Eligible students will be ranked in accordance with several criteria including WSU and transfer g.p.a., and 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 Architecture 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 or order to complete the program. Opportunities for undergraduate study are also provided through the Joint Center for Graduate Study in Richland, WA. Students from other departments may apply to pursue a minor in Electrical Engineering, 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 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.

324 Design of Computer Systems 4 (3-3) Prereq E E 314; Cpt S 316. Strategies and implementation for system operations, memory-management, I/O interfacing in medium and large computers.

331 Electromagnetic Fields and Waves 3 Prereq Phys 202; Math 315; major or minor in E E. Fundamentals of electrical fields, magnetic fields, and electromagnetic waves.


351 Distributed Parameter Systems 3 Prereq 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 Electrical Power Systems 3 Prereq E E 321, 331. Power system hardware; transformers, machines, power electronics and transmission lines; power systems analysis: load flow, transients, and stability.

362 Power Systems Laboratory I 2 (0-6) Prereq c// in E E 361. Experiments in simulation, modeling, transformers, rotating machines, and transmission lines.

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 314, or E E 214 and Cpt S 260; major in E E. Boolean algebra; minimization of Boolean functions; realization of combinational and sequential logic circuits; digital system organization and design.

424 (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. Credit not granted for both E E 424 and 524.

431 UHF and Microwave Circuits 3 (2-3) Prereq E E 351. Transmission lines and waveguides in the time and frequency domain, passive and active distributed parameter circuits.

434 VLSI Systems 1 3 (2-3) Prereq E E 311, 414 or c//; 466 or c//. Design of digital systems for VLSI fabrication; use of computer design aids.

441 Digital Control Systems 3 Prereq E E 489. Data conversion and sampling, sample-data control systems, digital control systems analysis, computer aided design and simulation microprocessor control.

444 VLSI Systems II 1 (0-3) Prereq E E 434. Testing theories; test generation; laboratory experience with test hardware and software; design of tests.

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.


472 Power Systems Laboratory II 2 (0-6) Prereq E E 362; E E 486 or 491; E E 493 or c/-. Experiments and design projects related to E E 486; 491, and/or 493.

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.

477 Electronics Laboratory 2 (1-3) Prereq c/- in E E 476. Laboratory applications of E E 476.

486 Power Electronics 3 Prereq E E 311, 314, 341, 361. High power electronics devices; theory, limitations, and applications; analysis and design of sources, motor controllers, and switching circuitry.

489 Introduction to Control Systems 3 Prereq E E 321. Analysis, synthesis, stabilization, and optimization of closed-loop systems.

491 Performance of Power Systems 3 Prereq E E 341, 361. Static and dynamic behavior of power systems, fault studies, surge phenomena, and economic considerations.

493 Protection of Power Systems 3 Analysis and equipment fundamentals of power system protection; symmetrical components, relays, fuses and circuit breakers with burden and fault calculations.

494 Computer Modeling of Dynamic Systems 3 (2-3) Prereq E E 489 or c/-. Analog and digital computer simulation of systems in engineering, mathematics, and other selected disciplines.

495 Internship in Electrical Industry II V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq E E 341 or 361. For juniors and seniors in E E. Students work full time in engineering assignments in approved industries.

496 Solid-State Electronics 3 Prereq E E 311; MSE 302. Physics of p-n junctions and operating principles of semiconductor devices; bipolar and fieldeffect transistors, switching devices and integrated circuits.

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

501 Linear System Theory 3 Prereq E E 489. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems.

502 Optimal Control Theory 2 Prereq E E 489. Vector spaces; optimization in a Hilbert space; linear quadratic regulator; stability analysis; Bontryazin's maximum principle; time, minimum fuel problems.

503 Large-Scale Dynamic Systems 2 Prereq E E 501. Lyapunov stability and input-output stability of large-scale systems, decentralized control, uncertainty, robust decentralized servomechanism, singular perturbation methods and multiple-time scale.

504 Applied Optics 3 Prereq E E 341, 351. Scalar diffraction theory, lenses, spatial filtering and optical information processing, holography. (a/y)

507 Random Processes in Engineerinc 3 Prereq Stat 443. Signal detection; optimum filter theory and spectral analysis of discrete and continuous processes in physical systems. Joint listing with the University of Idaho (EE ID 550).

508 Estimation and Identification 2 Prereq E E 507. Least-squares estimation; Wiener-Hopf equations; innovations processes; Wiener, Levinson, Kalman filters; stochastic realization theory; recursive least-squares and maximum likelihood identification algorithms.

509 Electric Machine Theory 3 Prereq E E 361. Generalized machine theory, stability and control of machine systems; introduction to machine design. Joint listing with the University of Idaho (EE ID 520).

510 Solid State Direct Energy Conversion 3 Prereq one sem therm. 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 (EE ID512).

516 Microwave and Optical Communication Systems 3 Prereq E E 351. Microwave hardware; atmospheric attenuation and diffraction; fading multipath channels; modes, rays dispersion, and attenuation in optic fibers, sources, and detectors. (a/y)

517 Electrical, Magnetic, Optical, and Conductive Properties of Solids 3 Prereq one sem thermo. Macroscopic, tensor representation of dielectricity, magnetoelectricity, piezoelectricity, magnetostiction; electro- and magneto-optical effects; thermoelectricity; Hall, Nernst and Etttingshausen 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.


522 High Voltage Engineering 3 High voltage-high power phenomena; design and measurements associated with electrical transmission, current interruption, insulation, transformation, lightning, and corona.

524 Digital System Architecture 3 Graduate level counterpart of E E 424; additional requirements. Credit not granted for both E E 424 and 524.

527 Antenna Theory 3 Prereq E E 351. Wire and aperture antennas as radiating, receiving, and scattering elements; arrays of coupled elements, reflectors. (a/y)

531 Energy Management and Planning 2 Concepts of energy management and planning; forecasting, resource assessment and impact studies.

551 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.


581 Advanced Topics in Power Engineering 1-3 May be repeated for credit.

582 Advanced Topics in System and Circuit Theory 1-3 May be repeated for credit.

586 Microprocessor System Design 3 (2-3) Prereq E E 414, 466 or c/. Design with microprocessors and associated MSI and LSI devices in instrumentation, control, and other applications.

595 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 (EE ID502).

596 Integrated Circuit Engineering 3 Prereq E E 496, 476. Basic aspects of integrated circuit engineering, fabrication, device behavior and linear circuit design.

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

A Bachelor of Science degree in Electrical Engineering ordinarily requires a total of 128 hours. At least 48 of the total hours must be in upper-division courses. Students in the program may elect to pursue the schedule of studies in either Electrical Engineering or Computer Engineering.

ELECTRICAL ENGINEERING

Freshman Year
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>E E 110 Introduction</td>
<td>2</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 171 Anal Geom Calc</td>
<td>4</td>
</tr>
<tr>
<td>Soc S Elective [S] (GUR)</td>
<td>3</td>
</tr>
</tbody>
</table>
### Second Semester
- Cpt S 203 Cpt Prog Engr 2
- Phys 201 Engineering 4
- Math 172 Anal Geom Calc 4
- Math 220 Int Linear Alg 2
- Hum Elective [H] (GUR) 3

### Sophomore Year
#### First Semester
- E E 214 Log An Ckts 3
- Math 273 Calculus III 2
- Phys 202 Engineering 4
- C E 213 Stat Mech Mat 4
- MSE 302 Materials Science 3

#### Second Semester
- E E 261 Electrical Ckts I 3
- E E 262 Electrical Ckts Lab 1
- E E 314 Microprocessor Syst 3
- C E 214 Intro Dynamics 2
- Math 315 Diff Equations 3
- Intercultural Studies [I] (GUR) 3

### Junior Year
#### First Semester
- E E 311 Electronics 3
- E E 321 Electrical Ckts II 3
- E E 331 Flds & Waves 3
- E E 352 E E Lab I 3
- Econ 201 Contemporary 4

#### Second Semester
- E E 341 Communications Syst 3
- E E 351 Dist Parameter Syst 3
- E E 361 Electrical Power Syst 3
- E E 362 Power Syst Lab I 2
- Engl 402 Pro Tec Wrt [W] (GUR) 3
- Hum Elective [H] (GUR) 3

### Senior Year
#### First Semester
- E E 489 Intro Control Syst 3
- M E 301 Thermodynamics 3
- Approved Math/Sci Elective 3
- Approved Technical Elective 1 8

#### Second Semester
- Adv Hum or Soc S Elective 3
- Approved Non-E E Technical Elec 3
- Approved Technical Elective 1 10

### Computer Engineering
#### Freshman Year
#### First Semester
- Cpt S 150 Prog Design 2
- Cpt S 154 PASCAL 2
- Engl 101 Composition [W] (GUR) 3
- Chem 105 Principles 4
- Math 171 Anal Geom Calc 4

#### Second Semester
- Cpt S 250 Adv Prog 3
- Phys 201 Engineering 4
- Math 172 Anal Geom Calc 4
- Math 220 Int Linear Alg 2
- Soc S Elective [S] (GUR) 3

### Sophomore Year
#### First Semester
- E E 214 Log An Ckts 3
- Math 273 Calculus III 2
- Phys 202 Engineering 4
- MSE 302 Materials Science 3
- Econ 201 Contemporary 4

#### Second Semester
- E E 261 Electrical Ckts I 3
- E E 262 Electrical Ckts Lab 1
- E E 314 Microprocessor Syst 3
- Math 315 Diff Equations 3
- Cpt S 316 Discrete Structures 3
- Intercultural Studies [I] (GUR) 3

### Junior Year
#### First Semester
- E E 311 Electronics 3
- E E 321 Electrical Circuits II 3
- E E 331 Flds & Waves 3
- E E 352 E E Lab I 3
- C E 213 Stat Mech Mat 4

#### Second Semester
- E E 341 Communications Syst 3
- E E 351 Dist Parameter Syst 3
- E E 324 Design of Comp Syst 3
- Engl 402 Pro Tec Wrt [W] (GUR) 3
- C E 214 Intro Dynamics 2
- Hum Elective [H] (GUR) 3

### Senior Year
#### First Semester
- E E 414 Fund Digital Syst 3
- E E 434 VLSI Design I 3
- E E 466 Pulse & Digital Ckts 3
Stat 443 Applied Probability 3
Approved Technical Elective 4 3

Second Semester
E E 424 Digital Syst Arch 3
E E 444 VLSI Design II 1
Adv Hum Elective [H] (GUR) 3
Approved Technical Electives 1 9

1 At least one senior elective must be chosen from the 400-level E E courses, and at least one senior elective must be chosen from the 300-400-level computer science courses. The remaining two electives may be chosen from either department. The student must select electives with an adviser’s approval.

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 one or the above schedules 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.

Department of English


The curriculum of the Department of English is designed for (1) students who are interested in preparing for graduate study in English, (2) students who wish specific training in the teaching of language and literature, and (3) students who desire a broad education emphasizing language and literature.

Students who are preparing to teach English in the public schools of Washington should examine the summary of requirements for majors and minors listed in the Department of Education in this catalog, and they should confer with representatives of that department concerning the requirements for certification.

The Department of English offers courses of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy in English. In cooperation with the Department of History, the department participates in the interdepartmental program of American Studies leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy in American Studies. In cooperation with the Department of Foreign Languages and Literatures the department participates in the interdepartmental program in Literary Studies leading to the degree of Doctor of Philosophy in Literary Studies.

Description of Courses

For explanation see Index under “Symbols”

Engl
100 Mechanics of Composition 3 Designed to improve the student’s writing ability to a level appropriate for entrance into Engl 101.
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 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

216 (316) Main Currents in American Culture 3 Great works of American culture since the 17th century.
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.

261 [H] Great Works Series 3 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 [G] Asian American Literature 3 Same as AAS1 311.
312 Hawaii/Pacific American Literature 3 Same as AAS1 312.
319 Black Literature in America, 1700-1900 3 Same as Bl St 319.
320 Black Literature in American 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 Poetry: 20th Century 3 20th century poetry including Continental.
333 Fiction: 20th Century 3 20th century fiction including Continental.
334 Drama: 20th Century 3 20th century drama including Continental.
335 [H] The Bible as Literature 3
338 Topics: Major Trends and Figures 3 May be repeated for credit; cumulative maximum 6 hours. Literary trends of major writers.
339 Film as Literature 3 May be repeated for credit; cumulative maximum 6 hours. Analytical study of film as a major literary genre.
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 The English Novel: Defoe to Eliot 3
367 The English Novel: Meredith to the Present 3
368 American Fiction to 1900 3
369 American Fiction since 1900 3
391 Topics in English 3 Study aboard (London).
392 Topics in English 3 Study abroad (London).
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 Seventeenth-century literature of the period 1500 to 1600.
407 English Renaissance Literature II 3 Seventeenth-century 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.
416 English Romantic Literature 3
Department of English

417 Victorian Literature 3
443 Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours. Credit not granted for both Engl 443 and 543.
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 Sociolinguistics and Psycholinguistics 3 May be repeated for credit; cumulative maximum 6 hours. Relationship of language to social and psychological structures.
470 American Culture Series 3 May be repeated for credit; cumulative maximum 6 hours. The West in American literature; American studies topics.
471 Literary Movements in America through WWI 3 May be repeated for credit; cumulative maximum 6 hours. Puritanism, Romanticism, Realism-Naturalism.
472 20th Century American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Literary movements in modern and contemporary American writing.
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 the teaching of English composition from remedial to advanced levels.
503 Old English: Anglo-Saxon 3
504 Old English: Beowulf 3
505 Theories and Methods of the Teaching of Technical and Professional Writing 3 Historical and theoretical bases for production of scientific discourse; training in its practical applications.
506 Seminar in 16th Century English Literature 3 May be repeated for credit; cumulative maximum 6 hours.
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 17th and 18th Century American 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 20th Century American Literature 3 May be repeated for credit; cumulative maximum 6 hours.
521 Seminar in British Romantic Literature 3 May be repeated for credit; cumulative maximum 6 hours.
522 Seminar in Victorian Literature 3 May be repeated for credit; cumulative maximum 6 hours.
525 Seminar in English Literature of the Seventeenth Century 3 May be repeated for credit; cumulative maximum 6 hours.
527 Seminar in English Literature of the Restoration and Eighteenth Century 3 May be repeated for credit; cumulative maximum 6 hours.
529 Seminar in 19th Century American Literature 3 May be repeated for credit; cumulative maximum 6 hours.
537 Seminar in English Literature 3 Major topics and figures. May be repeated for credit; cumulative maximum 6 hours.
543 Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of Engl 443; additional requirements. Credit not granted for both Engl 443 and 543.
544 TESOL: Theory and Methods 3 May be repeated for credit; cumulative maximum 6 hours. Theoretical issues and practical experience in ESL, classroom situations.
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; cumulative maximum 6 hours. Problems in the theory and practice of literary criticism.
549 Seminar in 20th Century British Literature 3 May be repeated for credit; cumulative maximum 6 hours.
550 Seminar in Poetry or Non-Fiction Prose 3 May be repeated for credit; cumulative maximum 6 hours. Histor-
ical and generic studies in poetry and non-fiction prose.

554 History of the English Language 3
555 Seminar in Middle English Literature 3 May be repeated for credit; cumulative maximum 6 hours.

560 Seminar in Drama 3 Historical and generic studies in dramatic literature. May be repeated for credit; cumulative maximum 6 hours.

567 Seminar in Prose Fiction 3 May be repeated for credit; cumulative maximum 6 hours. Historical and generic studies of prose fiction.

573 Seminar in American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Major topics and figures.

580 Seminar in Medieval Literature 3 May be repeated for credit; cumulative maximum 6 hours. The literature of western Europe from 450 to 1500.

591 Seminar in Literary Studies 3 May be repeated for credit; cumulative maximum 6 hours. 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 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.

Five programs are offered for the English major; all lead to the degree of Bachelor of Arts in English. Option I is a traditional English 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. Option IV, English/Business, is designed to prepare students for careers in business through an education combining selected professional training with broad education in liberal arts and language courses. Option V, English/Pre-Law—students electing an English major as preparation for the study of law can receive special advisement from the department's pre-law adviser.

The department also offers a minor in English.

**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, 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 3
   4) Engl 255, 256, 354, 458 3
   Total 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

**Option IV: English/Business**

Requirements for graduation include 21 hours in language and literature courses, 9 hours in writing courses, 18 hours in business core courses, and 7-11 hours in computer science.
related courses. A student must also fulfill the graduation requirements of the College of Sciences and Arts.

The English selections emphasize courses to develop verbal skills and courses devoted to the major events of our literary culture. The business and computer science core courses create the curriculum requisite for beginning a career in business. The combination develops potential placement opportunities and insures graduates flexibility, successful performance, and professional advancement in various business careers, especially the many requiring effective contact and communication with others.

A) Three from Engl 209, 210, 245, 246  
B) Engl 101 or 198, 301, and one from 351, 352, 401, or 402  
C) One from each of the following:  
   1) Engl 255, 256, 354, 458  
D) Two from literature courses numbered above 300  

**Business Core Courses:** B Law 210, QMeth 215 or Acctg 230, Econ 102 or 203, Mgt 301, Fin 325, Mktg 260.  

**Computer Science Core Courses:** One from Math 107, 201, 202; Cpt S 150; one from Cpt S 151, 153, 154, 241.  

**Option V: English/Pre-Law**

Requirements for graduation include 30 hours in English: 21 hours in language and literature, 9 hours in writing. Also required are 6 hours each in philosophy, history, business and/or economics, and political science. (Among these, Elementary Logic, Ethics, and Principles of Accounting are required.) While completing the option, students must also fulfill the graduation requirements of the College of Sciences and Arts. For the junior and senior years a wide variety of courses are recommended from English, political science, psychology, speech, sociology, philosophy, anthropology, economics, and history.

Students can fulfill departmental and General University Requirements and have as many as 50 hours of electives remaining in the 120 hours required for graduation. This flexibility allows them to choose groups of courses that will best prepare them for success in particular legal specialties such as corporate, environmental, or international law.

The option is designed to provide a broad education in areas identified by national legal associations and law schools as requisite to success in the profession. While stressing high verbal skills as essential, they strongly recommend students follow “a broadly based undergraduate program that includes training in analytical reasoning and writing.” They seek “students who can think, read, and write and who have some understanding of the forces that have shaped human experience” (1984-85 Prelaw Handbook, p. 16).

**English Minor**

The student must complete a minimum of 16 hours in English courses (excluding 101, 108, 198, and 199), half of which must be upper-division. The 16 hours must also include one composition 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 five undergraduate programs described above. Students with undergraduate majors in such subjects as philosophy, foreign languages, and history may also be accepted for graduate study in the department. Every student should be well grounded in at least one modern foreign language.

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**Department of Entomology**

**Professor and Department Chair:** E. P. Catts;  
**Professors:** R. D. Akre, A. A. Berryman, R. P. Harwood;  
**Associate Professors:** J. J. Brown, G. E. Long, G. L. Piper, W. J. Turner;  
**Assistant Professor:** L. K. Tanigoshi.

Insects and other related arthropods are dominant consumers in terrestrial ecosystems. They compete at all levels with humans in the production, processing and use of food and fiber resources. They are a major health threat to most of the world’s people. In-depth knowledge in basic areas of insect identification, morphology, physiology, behavior and ecology are prerequisites to developing and applying control measures against our arthropod competitors. Ecological and legal restrictions on 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 designed 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, pest 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**


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 entomology. (SS)

441 Taxonomic Entomology 5 (3-6) Prereq Entom 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 environment; 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)

447 Biological Control of Arthropod Pests and Weeds 4 (2-6) Prereq general entomology or ecology. Principles and methods of controlling insect pests and weeds by biological means. (a/y) Cooperative course taught at the University of Idaho (Ent ID 447).

448 Medical Entomology 4 (3-3) Prereq Bio S 103, 104. Insects and related arthropods affecting human and other vertebrate animal health; means of control. (a/y)

450 Principles of Applied Entomology 4 (3-3) Prereq Entom 340 or 343. Utilization of biological, physical, cultural, and chemical factors in managing insect pest populations. (a/y)

462 Systems Analysis in Integrated Crop Management 3 (2-3) Prereq basic ecology; major in biological sciences. Techniques and theory for evaluation and use of decision-support models. Credit not granted for both Entom 462 and 562. (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 (Ent ID 472).

474 Aquatic Entomology Lab 2 (0-6) Prereq c// in Entom 472. Field trips required. Cooperative course taught at the University of Idaho (Ent ID 474).

480 Urban Entomology 3 (2-3) Prereq Entom 340 or 343. Biology and management of arthropod and non-arthropod pests in urban-industrial communities; pests of structural, household, and recreational importance. Credit not granted for both Entom 480 and 580. (a/y)

484 Insect Anatomy and Physiology 4 (3-3) Prereq general entomology. Organ systems of insects and their physiological functions. Cooperative course taught at the University of Idaho (Ent ID 484). (a/y)

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

511 Principles of Systematic Biology 3 (2-3) Same as Zool 511.

517 Entomological Literature 2 Survey
and use of entomological literature and bibliographic aids. (a/y) Cooperative course taught at the University of Idaho (Ent ID 517).

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 442; general ecology or Entom 443. Population and community dynamics; theory and application in natural and artificial systems. (a/y) Cooperative course taught at the University of Idaho (Ent ID 541).

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 230, 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 vertebrates. (a/y)

547 Biological Control of Arthropod Pests and Weeds 4 (2-6) Graduate level counterpart of Entom 447; additional requirements. Credit not granted for both Entom 447 and 547. Cooperative course taught at the University of Idaho (Ent ID 547).

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 4 (3-3) Prereq Math 171; Cpt S 201; 20 hrs. biological sciences. Practical methods for the acquisition, storage, analysis, and presentation of entomological data. (a/y)

562 Systems Analysis in Integrated Crop Management 3 (2-3) Graduate level counterpart of Entom 462; additional requirements. Credit not granted for both Entom 462 and 562. (a/y)

580 Urban Entomology 3 (2-3) Graduate level counterpart of Entom 480; additional requirements. Credit not granted for both Entom 480 and 580. (a/y)

593 Seminar 1 May be repeated for credit. Prereq 20 hrs biology. Reporting problems and research in entomology.

596 Developmental Systems in Insects 3 Prereq Entom 450 or 500. Insect physiology concentrating on hormones, reproduction, vitellogenesis, embryology, molting, and metamorphosis. (a/y) Cooperative course taught at the University of Idaho (Ent ID 596).

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 203, 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); GenB 301; Math 140 or 171; Phys 101 and another physical science course; Zool 352 or 353; Zool 224 or Bot 120.

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, J. A. Kittrick; Associate Professors, G. L. Young, E. H. Franz, F. Steiner; Assistant Professors, W. W. Budd, J. D. Karte.

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.

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 and Home Economics, Business and Economics, Engineering and Architecture, 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.

174 Introduction to Meteorology and the Atmospheric Environment 3 Same as Ch E 174.

301 Forest and Range Environments 3 Same as FRM 301.

303 [U] Conservation of Renewable Resources 3 Same as FRM 303.

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 572. 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.

414 Introduction to Environmental Biophysics 2 Same as Soils 414.

415 Environmental Biophysics Lab 1 (0-3) Same as Soils 415.

427 Environmental Chemistry 2 Same as Chem 427.

444 Environmental Impact Statement As-
essment 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.

445 Hazardous Waste Management 3 (2-3) Prereq Math 171; Soils 201 or Geol 102. Environmental, technical, and political aspects of hazardous waste management; evaluative methods, risk assessment, and current management requirements. Credit not granted for both Env S 445 and 545.

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 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.

545 Hazardous Waste Management 3 (2-3) Graduate level counterpart of Env S 445; additional requirements. Credit not granted for both 445 and 545.

550 Legal Process and Resource Management 2 Law and legal processes as they relate to resource decisions, management, development, and preservation. Cooperative course taught at the University of Idaho (Law ID 511).

571 Air Pollution Meteorology 3 Same as Ch E 571.

572 Air Pollution Measurement Techniques 3 (2-3) 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 (Geog ID 420).

593 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours.

595 Graduate Internship V 1-5 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

450 Principles and Practice of Planning 3 Prereq Env S 101. History, theory, and processes in regional planning; contemporary issues and professional practice.

535 Regional Planning Theory 2 Prereq Pol S 102; Econ 203. Theories of planning; synoptic, incremental, transactive, advocacy, and radical planning traditions; quantitative planning theories.

540 Planning History 2 Prereq Soc 101. Development of regional planning in various civilizations from classical times to present day.

541 Planning in Rural Environments 3 Prereq R P 540. Planning theories and methods applied to rural regions, issues, and problems unique to rural planning.

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
Program in Environmental Science and Regional Planning

(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 (Geog ID 585).

575 Geographic Information Systems 3 Prereq course in computer programming. Computerized management of data organized on regional geographic bases; preparation overlays, coding, and manipulation of data for regional planners and land managers. Cooperative course taught at the University of Idaho (Geog ID 475).

590 Special Topics in Regional Planning 1-5 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
- Env S 101 Env & Human Life 4
- Engl 101 Composition 3
- Chem 105 Principles 4
- Math 107 or 201 3
- Soc 101 Introduction 3

Second Semester
- Anth 101 General 3
- Chem 106 Principles 3
- Chem 107 2
- Math 171 or 202 3-4
- Econ 201 Principles 4

Sophomore Year

First Semester
- Bio S 103 Introductory 4
- Phys 101 or 201 4
- Geol 102 or Soils 201 4-3
- Engl 201, 301, or 402 3
- Cpt S 150 plus one of 151-4 4

Second Semester
- Bio S 104 Introductory 4
- Phys 102 or 202 4
- Chem 240 or 340/341 4-5
- Humanities Elective 3

Junior Year

First Semester
- Bact 101 or 202 4-5
- BC/BP 364 Intro Biochem 3
- BC/BP 366 Intro Biochem Lab 1
- Upper-division Pol S2 3
- Env S 493 Seminar3 1-2
- Electives/Option Courses 4-5

Second Semester
- Upper-division Anth2 3
- Bio S 372 General Ecology 4
- Env S 493 Seminar 1-2
- Electives/Option Courses 7

Senior Year

First Semester
- Env S 404 Ecosystem 3
- Bio S 474 Human Ecology 3
- Upper-division Soc9 3
Env S 493 Seminar 1-2
Electives/Option Courses 6

Second Semester Hours
Upper-division Econ 2
Biom 412 (or other statistics) 3
Env S 444 Impact Statements 3
Env S 493 Seminar 1
Electives/Option Courses 4

Geol 403 is acceptable as a substitute for this requirement.

Anthropology—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 Ec 300, or Econ 472, Econ 481.

Env S majors are required to complete four 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 and a minimum g.p.a. of 3.0. 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. Students interested in assistantships should provide Graduate Record Examination Scores. 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, an option with a minimum of 10 credit hours of courses; and a thesis or special project. A minimum of 32 hours of graduate credits is required. The program has been successful in placing M.S. graduates in a variety of positions with federal, state, and local agencies, industries, and academia, as environmental and resource management specialists.

Students entering the Master of Regional Planning (MRP) program have a wide variety of backgrounds in the natural and social sciences. There are no specific prerequisite course requirements for entrance, but applicants are expected to have a minimum g.p.a. of 3.00 in their undergraduate field and to present evidence of commitment to the field of planning. Prior work experience in planning or related fields is strongly considered in evaluating applicants. Students are required to complete not less than 48 graduate credit hours, including a minimum of 18 hours of core planning courses, 6 hours of thesis or project credit, and 5 hours of field internship or practicum.

A cooperative arrangement with Eastern Washington University's Urban Planning Department allows students to undertake course work or study with faculty from EWS on a selective basis. MRP candidates are expected to develop a specialization through course work in an allied discipline, but the philosophy of the program is oriented toward preparing graduates for practice in public agencies, tribal agencies, or as consultants in the private sector. Graduates of the program are employed as professional planners, and students are encouraged to work part time while earning their degrees.

Department of Fine Arts

Professor and Department Head, A. Okazaki;
Professors, R. Coates, R. Feasley, F. Ho, K.
Monaghan; Associate Professor, J. Dallhausen,
J. Hockenhull, R. Helm, J. Schuman, P. Siler;
Assistant Professors, J. Leisir, S. Platt, J.
Swindell.

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 Educa-
tion, 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>F A</td>
<td>101</td>
<td>[H] Introduction to Art 3 For non-majors. Introduction to various visual art forms, emphasis on contemporary period.</td>
</tr>
<tr>
<td></td>
<td>103</td>
<td>Art 3 (0-6) Introduction to formal elements through studio experience.</td>
</tr>
</tbody>
</table>

### Art History

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>104</td>
<td>Black Visual Arts 3 Same as Bl St 102.</td>
</tr>
<tr>
<td></td>
<td>201</td>
<td>[H] Art of Western Civilization 3 Historical survey of art and architecture from prehistory through the Renaissance.</td>
</tr>
<tr>
<td></td>
<td>202</td>
<td>[H] Art of Western Civilization 3 Historical survey of art and architecture from the High Renaissance to the present.</td>
</tr>
<tr>
<td></td>
<td>204</td>
<td>Mexican Art History 3 The history of the art of Mexico from 3000 B.C. to present.</td>
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<tr>
<td></td>
<td>205</td>
<td>Native American Arts 3 A survey of the arts and crafts of Native Americans.</td>
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<tr>
<td></td>
<td>301</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>302</td>
<td>Renaissance Art 3 Prereq F A 202. Painting, sculpture, and architecture in western Europe from the 14th through the 16th century.</td>
</tr>
<tr>
<td></td>
<td>303</td>
<td>Modern Art—19th Century 3 Modern art in the early modern period.</td>
</tr>
<tr>
<td></td>
<td>304</td>
<td>Modern Art—20th Century 3 Modern art in the 20th century.</td>
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<tr>
<td></td>
<td>305</td>
<td>Chicano Art 3 Same as Ch St 321.</td>
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<tr>
<td></td>
<td>310</td>
<td>Women Artists 3 Same as W St 310.</td>
</tr>
<tr>
<td></td>
<td>403</td>
<td>Topics in Advanced Art History: Modern 3 Selected areas of modern art for advanced students.</td>
</tr>
<tr>
<td></td>
<td>404</td>
<td>Topics in Advanced Art History: Pre-19th Century 3 Selected areas of pre-modern art history.</td>
</tr>
</tbody>
</table>

Gr 00 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td></td>
<td>Drawing 3 (0-6) Composition in pictorial space, visualization of ideas, drawing from life.</td>
</tr>
<tr>
<td></td>
<td>111</td>
<td>Figure Drawing 3 (0-6)</td>
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<tr>
<td></td>
<td>312</td>
<td>Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 110 or 111.</td>
</tr>
<tr>
<td></td>
<td>313</td>
<td>Figure Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 111.</td>
</tr>
<tr>
<td>510</td>
<td></td>
<td>Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
<tr>
<td>511</td>
<td></td>
<td>Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
<tr>
<td>512</td>
<td></td>
<td>Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
</tbody>
</table>

#### Painting

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>320</td>
<td></td>
<td>Beginning Painting 3 (0-6) Basic painting; introduction to composition and color structure.</td>
</tr>
<tr>
<td></td>
<td>321</td>
<td>Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.</td>
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<tr>
<td></td>
<td>322</td>
<td>Transparent Watercolor 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.</td>
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<tr>
<td></td>
<td>423</td>
<td>Advanced Painting V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 321. F A majors only.</td>
</tr>
<tr>
<td>520</td>
<td></td>
<td>Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
<tr>
<td>521</td>
<td></td>
<td>Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
<tr>
<td>522</td>
<td></td>
<td>Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.</td>
</tr>
</tbody>
</table>

#### Graphic Design

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>331</td>
<td></td>
<td>Graphic Design 3 Introduction to visual communication.</td>
</tr>
<tr>
<td></td>
<td>332</td>
<td>Graphic Design 3 (0-6) Prereq F A 103, 110 or 111, 331.</td>
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<tr>
<td></td>
<td>433</td>
<td>Illustration V 3(0-6) or 6 (0-12) May be repeated for credit. Prereq F A 111,</td>
</tr>
</tbody>
</table>
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 potters 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.

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. 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.

Study Abroad
306 Topics in Art 3 Study abroad (Guadalajara).
311 Topics in Art 3 Study abroad (Guadalajara).
314 Topics in Art 3 Study abroad (London).
315 Topics in Art 3 Study abroad (London).
316 Topics in Art 3 Study abroad (Avignon).
317 Topics in Art 3 Study abroad (Avignon).
318 Topics in Art 3 Study abroad (Cologne).
319 Topics in Art 3 Study abroad (Cologne).

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 103—3 hours

Art History
F A 101, 201, 202, 303, 304—15 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.

<table>
<thead>
<tr>
<th></th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Required Courses</td>
<td>35</td>
</tr>
<tr>
<td>GUR</td>
<td>47</td>
</tr>
<tr>
<td>F A Electives (emphasis)</td>
<td>18</td>
</tr>
<tr>
<td>Electives</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
</tr>
</tbody>
</table>

Note for Secondary School Program in Art Education: Required courses for 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 101, 360, 340, 370, and 3 hours upper-division electives in F A.

ART MINOR—18 hours
F A 103 Art
F A 110 Drawing
F A 303 Modern Art
Upper-division electives

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 Human Nutrition


The Department of Food Science and Human Nutrition offers courses of study in two major fields—food science and human nutrition and foods, with curricula and options available in various special areas.

Food Science

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.

The undergraduate food science curriculum 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).

Human Nutrition and Foods

The human nutrition and foods curriculum is designed to prepare students for the profession of dietetics, for positions as home economists in food-related organizations, and for research and graduate studies.

Six options of study are offered to men and women interested in careers related to food, nutrition, and foodservice management. These courses of study lead 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 courses to prepare the student for entry-level positions in the retail 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 communications 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.

By careful course selection, students enrolled in this option may fulfill the requirements for a minor in communications. The minor will strengthen the student's communications 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 a 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 foodservice management are required. The graduate may become a member of the American Dietetic Association by completing an administrative internship. Graduates are eligible for administrative positions in hospitals, schools, colleges, and university food service; restaurants; as well as government and private agencies. This option does not prepare students for 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 those in the General Dietetics Option who complete a baccalaureate 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. This option requires more science courses than the above option. 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 Research 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 Science, 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 nutrition leading to the degree of Master of Science in Nutrition, and Doctor of Philosophy (Nutrition).

Description of Courses

For explanation see Index under “Symbols”

Food Science

FSHN

102 Animal Products 3 (2-3) Animal product industries, including classification, grading, handling, use, and nutritional value.

170 Food for Mankind 2 Interrelationships between people and their food supply; broad coverage of contemporary food-related topics.

270 Food Selection and Appraisal 2 Qualities of food necessary for acceptability by the consumer; includes government and industry standards.

301 Dairy Products 2 (1-3) Prereq Bact 101 or 201; Org Chem. Specialized techniques and practices of dairy product manufacturing and marketing. Field trip required.

302 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 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 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 FSHN 401 and 501.

402 Seminar in Food Science 1 May be repeated for credit; cumulative maximum 2 hours. Current literature and special reports.

416 Microbiology of Food 3 (2-3) Same as Bact 412.

422 Food Quality Evaluation 3 (2-3) Prereq senior or graduate in FSHN. Techniques in evaluation of quality of foods by sensory and instrumental methods. Credit not granted for both FSHN 422 and 522. (a/y)

433 Agricultural Processing 3 Prereq Ag M 210 or Math 140. 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 FSHN 433 or c/. Experiments in heat transfer, fluid flow and dehydro.
Food Process Engineering 3 Same as Ag E 587. Graduate level counterpart of FSHN 487; additional requirements. Credit not granted for both FSHN 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.

Schedule of Studies

FOOD SCIENCE

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.

A. 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>FSHN 170, 301, 302, 303, 304, 402, 422, 416, 433, 434, 450, 460, 461, 462, 470</td>
<td>37</td>
</tr>
<tr>
<td>Ag Ec 201, 350</td>
<td>6</td>
</tr>
<tr>
<td>Chem 105, 106, 107, 220, 222, 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 FSHN 333</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101; 201 or 301; Spe 102 or 302</td>
<td>12</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
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<tr>
<td>Math 140</td>
<td>4</td>
</tr>
<tr>
<td>Humanities Electives</td>
<td>6</td>
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<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>A S 101, Hort 201, 311, 320, or Agron 201</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
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</tbody>
</table>

B. 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>FSHN 170, 301, 302, 303, 304, 402, 416, 422, 433, 434, 450, 460, 461</td>
<td>30</td>
</tr>
<tr>
<td>Chem 101, 102, 240 BC/BP 364</td>
<td>15</td>
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<tr>
<td>Math 140; Phys 101</td>
<td>8</td>
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<tr>
<td>Bio S 103; Bact 201</td>
<td>9</td>
</tr>
<tr>
<td>Biom 412 or QMath 215</td>
<td>3-4</td>
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<tr>
<td>Ag Ec 201, 350, 360</td>
<td>9</td>
</tr>
<tr>
<td>FSHN 130, 333, or A S 301</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, 311, 320, or Agron 201</td>
<td>3</td>
</tr>
<tr>
<td>B Law 210, Accr 230, 231, or Cpt S 150; 153 or 154; Psych 306 or Mgr 301</td>
<td>13</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

C. Recommended Electives

Food Production: A S 101, Hort 201, 311, 320; Agron 201.

Engineering: Math 171a, 172a, Phys 201b, 202b, C E 341, 342; Ch E 301, 302, 401, 402.

Nutrition: FSHN 130, 333, 434.

Science: Math 171a, 172a, Chem 331, 340a, 341a, 342a, 364, 366, 331, 472.

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: FSHN 416, 460, 461.

Preparation for Graduate Study

Students who plan work toward an advanced degree should elect courses which will support their minor areas of interest or strengthen their major. Consultation with their adviser will be found most helpful.

Description of Courses

For explanation see Index under "Symbols"

HUMAN NUTRITION AND FOODS

FSHN
120 Food Preparation 3 (2-3) Principles
and methods of preparation, qualities, composition and uses of foods. Credit not granted for both FSHN 120 and 220.

130 [B] 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 FSHN 130 and 233.

220 Food Preparation 3 (2-3) Prereq Chem 240. Application of scientific principles in the use and preparation of selected standard quality food products. Credit not granted for both FSHN 120 and 220.

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 or human development; impact of environment, economics, culture on food and nutrition. Credit not granted for both FSHN 130 and 233.

266 Management of Home Equipment 3 (2-3) Management of equipment and utilities in the home.

280 Quantity Food Production 3 Prereq FSHN 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 V 1 (0-3) to 2 (0-6) Prereq FSHN 120 or 220. Recipe adjustment and costing; preparing and serving food in quantity.


334 Family Food Management 3 (2-3) Prereq FSHN 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 HNF major; c// in FSHN 475 for CUOGD students. Dynamics of nutritional care and foodservice management in health and disease.

381 Quantity Food Purchasing 2 Prereq FSHN 280; 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 FSHN 420. Studies of food products reported through research paper or public demonstration.

422 Food Quality Evaluation 3 (2-3) Prereq senior or graduate in FSHN. Techniques in evaluation of quality of foods by sensory and instrumental methods. Credit not granted for both FSHN 422 and 522. (a/y)

430 (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.

431 Prenatal, Infant and Child Nutrition 2 Prereq FSHN 333 or c//. Nutrition of the mother and fetus during pregnancy and of the child from infancy to adolescence. (a/y)

435 Diet Therapy 3 (2-3) Prereq FSHN 430 or c//. Nutrition principles applied to pathological conditions in man.

436 Nutrition Education 3 Prereq FSHN 333. Individual and group nutrition education programs; methods, resources, settings, and community structures for guiding change in nutritional behavior.

438 Readings in Foods and Food Systems Management 2 Prereq FSHN 480 or c//. Reports, discussions and reviews of recent scientific literature and developments in foods and food systems management. Credit not granted for both FSHN 438 and 538.

439 Current Topics in Nutrition 2 Prereq FSHN 430. Analysis of scientific, popular and legislative articles pertaining to topics of current interest in nutrition. Credit not granted for both FSHN 439 and 539.

440 Clinical Dietetics 3 By interview only. Advanced nutrition principles applied to pathological conditions in humans
and principles of participation in delivery of nutritional care.

475 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.

480 Organization and Management of Food Service Systems 3
Prereq FSHN 280; for seniors only. Organization and management principles as applied to food.

481 Dietetics/Management Practicum V 3
(1-6) to 6 (1-15) May be repeated for credit; cumulative maximum 6 hours. Prereq senior in FSHN. Application of theory in assessing, implementing, and evaluating dietary and management practices. Credit not granted for both FSHN 481 and 498.

482 Equipment for Food Service Systems 3
Prereq FSHN 280, 281. Materials, specifications, operations and use, maintenance schedules of kitchen equipment; dining room facilities and equipment flow. (a/y)

484 Computer-Assisted Dietary Management 3
Prereq FSHN 480 or c/c/. Use of computer programs to aid management in inventory control, production, food cost accounting and patient nutrient analysis.

485 Clinical Experience in Food Service Systems 3 (1-6) By interview only. Experience in food systems management in clinical settings.

498 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 FSHN 481 and 498.

503 Advanced Human Nutrition I 3
Prereq FSHN 430. Experimental basis for human nutritional requirements and determination of nutritional status.

504 Advanced Human Nutrition II 3
Prereq FSHN 503. Metabolic responses to foods with emphasis on neutral and hormonal responses; interaction of nutrients at the whole body level.

521 Research Techniques in Nutrition 3
(1-6) Prereq 6 hrs nutrition. Methods of conducting field, applied and metabolic studies in human nutrition.

522 Food Quality Evaluation 3
(2-3) Graduate level counterpart of FSHN 422; additional requirements. Credit not granted for both FSHN 422 and 522. (a/y)

525 Changing Food Patterns 2 or 3
Prereq FSHN 334; 8 hrs social science; Zool 251 or Chem 240. Interrelationships of food behavior and nutrition; implications for teaching and development of instructional plans.

526 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.

530 International Nutrition 3
Prereq advanced nutrition course. World nutrition, cultural, and economic problems related to meeting nutritional needs.

531 Nutrition and Aging 2 or 3
Prereq advanced nutrition course. By interview only. Assessment, evaluation, and treatment of nutritional problems of the aged.

532 Human Digestion and Absorption 3
Prereq BC/BP 364; FSHN 450. Pathological biochemistry, anatomy, and physiology of digestion and absorption in human gut.

533 Pathophysiology of Human Nutrition 3
Prereq Zool 553; BC/BP 364; FSHN 435. Protein, fat, carbohydrate and other nutrient pathophysiology in the human.

536 Nutrition Program Theory and Practice 3
(2-3) Prereq FSHN 456. Societal and behavioral determinants of foods habits; 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 FSHN 458; additional requirements. Credit not granted for both FSHN 458 and 538.

539 Current Topics in Nutrition 2
Graduate level counterpart of FSHN 459; additional requirements. Credit not granted for both FSHN 459 and 539.

575 Qualifying Experience in Dietetics 8
or 16 May be repeated for credit; cumulative maximum 16 hours. By interview only. Supervised professional experience in clinical, administrative, and
community dietetics for advanced degree candidates. Meets ADA requirements for qualifying experience.

Problems, Research, and Thesis

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.)

C. Department Options

1. Food-Related Business Option
Chem 101, 102 Introductory 8
Bact 101 Elem Bact 4
Soc 101, Psych 101, or Psych 102 3
Spe 102 Pub Speaking 3
FSHN 266 Mgmt Home Eq 3
FSHN 270 Food Sel & App 2
FSHN 420 Comp Foods 2
FSHN 438 Readings 2-3
FSHN 498 Food Practicum 1-8
FSHN 301, 302, 303, 304 5
Mgt 301 Mgmt & Org 3
Mktg 360 Marketing 3
Spe 301, Ag 205, or Spe 235 3
Mktg 367 or CFS 350 3
CFS 353 Fam as Consumers 3
Soc 373 Mass Comm 3
Jour 225 or Engl 402 3
Plus a minimum of 15 hours selected from ACE 301, 401; B Law 210; Acctg 230; Mgt 401; Adver 280; P R 413; Educ 301, 445; FSHN 421, 434, 436, 438, 498, 522; Psych 306; Soc 351; statistics or computer science.

2. Food-Related Communications Options* or Minor**
Chem 101, 102 8
Bact 101 Elem Bact 4
Psych 101 or Soc 101 3
FSHN 301, 302, 303, 304 2-5
Mktg 360 Marketing 3
Com 225 Newswriting 2
Com 235 Reporting 2
Com 250 Intro Broadcasting 3
Com 280 Adver Prin & Pract 3
Com 312 Public Relations 3
Com 350 News Editing 3
Com 373 Soc Mass Comm 3
Com 413 Public Info 3
FSHN 266 Mgmt Home Eq 3
FSHN 270 Food Sel & App 2
FSHN 420, 421 Comp Foods 3
FSHN 438 or 439 2-3
FSHN 498 Food Practicum 1-8

*For an option the student should select at least 12 credits from the listed communications courses.
**For a minor all of the listed communications courses must be taken.
### 3. General Dietetics Option
- Chem 105, 106, 107: 8
- Bact 101 Elem Bact: 4
- Psych 101 or Soc 101: 3
- Math 101 Inter Alg: 3
- BC/BP 364, 366: 4
- Mgt 301 or Psych 306: 3
- FSHN 270 Food Sel & App: 2
- FSHN 381 Quant Fd Purch: 2
- FSHN 420 Comp Foods: 2
- FSHN 430 Hum Nutr: 3
- FSHN 435 Diet Therapy: 3
- FSHN 436 or Educ 301: 3-4
- FSHN 438 or 439: 2
- FSHN 480 Mgmt Fd Sys: 3
- FSHN 481 Dietetics/Mgmt: 3-6
- FSHN 484 Cpt Diet Mgmt: 3

### 4. Foodservice Management Option
- Chem 101, 102: 8
- Bact 101 Elem Bact: 4
- Psych 101 Introduction: 3
- Soc 101 Introduction: 3
- Math 101 Inter Algebra: 3
- B Law 210 Law & Business: 3
- Accdg 230 Accounting: 3
- Mgt 301: 3
- Econ 350 Labor Econ: 3
- Cpt S 150, 153 or 154, or 405: 3
- FSHN 270 Food Sel & App: 2
- FSHN 381 Quant Fd Purch: 2
- FSHN 420, 421: 3
- FSHN 436 or Educ 301: 3-4
- FSHN 438 Readings: 2
- FSHN 480 Mgmt Fd Sys: 3
- FSHN 481 Dietetics/Mgmt: 3-6
- FSHN 482 Equipment: 3
- FSHN 484 Cpt Diet Mgmt: 3

### 5. Coordinated Undergraduate Option in General Dietetics
- Chem 105, 106, 107: 8
- Bact 101 Elem: 4
- Soc 101 Introduction: 3
- Psych 101 or 102: 3
- Math 101 Inter Algebra: 3
- BC/BP 364, 366: 4
- Mgt 301 or Psych 306: 3
- FSHN 350 Dynam Diet: 2
- FSHN 381 Quant Fd Purch: 2
- FSHN 430 Hum Nutr: 3
- FSHN 436 Nutr Educ: 3
- FSHN 438 Readings: 2
- FSHN 439 Cur Topics: 2
- FSHN 440 Clin Dietetics: 3
- FSHN 475 Clin Exp Dietetics: 19
- FSHN 480 Mgmt Fd Sys: 3
- FSHN 484 Cpt Diet Mgmt: 3
- FSHN 485 Clin Exp: 3

### 6. Research Option
- Chem 105, 106, 107: 8
- Bio S 102 Intro Biol: 4
- Bact 201 Gen Microb: 5
- Psych 101 or 102 or Soc 101: 3
- Math 140, 141: 8
- Chem 220, 222: 4
- BC/BP 364, 366: 4
- Phys 101, 102: 8
- Biom 412 Statistics: 3
- FSHN 270 Food Sel & App: 2
- FSHN 420, 421: 3
- FSHN 430 Hum Nutr: 3
- FSHN 438 or 439: 2

*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.

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**Department of Foreign Languages and Literatures**

*Associate Professor and Department Head, J. T. Brewer; Professors, A. Chang, H. C. Kim, W. A. Luchtig; Associate Professors, F. W. Blackwell, A. Caniera, E. R. Gonzalez, E. F. Hartman, B. M. Ingemanson, C. J. Kenlan, J. Labat, M. M. Matteson, G. S. Mazur, L. A.*
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 courses in language, literature, and culture.

Courses are offered regularly in Chinese, Greek, Japanese, and Latin. 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.

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. *Fiesta Latina* and *Deutscher Abend* are open to students of those languages. The *maison française*, 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. 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.

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

270 [K] Introduction to South Asian Culture 3 Same as Hist 270.
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 [G] Eastern Civilization and Literature 3 The development of eastern civilization as expressed through literature and cultural aspects.
324 Methods of Teaching Foreign Languages 3 Prereq 2 yrs foreign language.
350 Speech, Thought, and Culture 3 Same as Anth 350.
352 Gandhi and Twentieth Century India 2 Twentieth-century India: Gandhi, his concepts, impacts, contemporary relevance; India today.
410 Racism and Sexism in Language 3 Uses and misuses of color/race and sex in language and literature. (SS)
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.
505 Topics in Comparative Literature 3 May be repeated for credit; cumulative
maximum 6 hours. Comparative approach to selected literary topics.  

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 (SS)  
401 Third Semester 4 Prereq Chin 302. Chinese literature and civilization through reading of selected masterpieces; Chinese used as medium of communication.¹

Classics  
Clas  
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 Third Semester French 4 Prereq Fren ¹Not open to native speakers.  
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 (SS)  
304 Introduction to Advanced French Studies 4 Prereq Fren 203. Selected French texts in cultural context; continued practice in spoken and written French.¹  
315 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 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.  
318 Topics in French Civilization 3 Study abroad (Avignon).  
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. (SS)  
333 [H] Survey of French Literature to 1700 3 Prereq Fren 304. Transitional course shifting emphasis from language to literature.  
334 [H] Survey of French Literature after 1700 3 Prereq Fren 304.  
350 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.¹  
405 Comprehensive French Conversation 3 Prereq Fren 322 or 323. Intensive oral practice in small groups.¹  
416 Seminar in French Civilization 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Fren 322, 323, 333, or 334.  
421 French Literature of the Seventeenth Century 3 Prereq Fren 322, 323, or 333. Selected works and authors; the classical period. (a/y)

215
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>422 Advanced French Grammar and Syntax 2</td>
<td>Prereq Fren 322 or 323. Fluency and accuracy developed.</td>
</tr>
<tr>
<td>423 Pronunciation and Phonetics 2</td>
<td>Prereq Fren 322 or 323. A practical approach to French phonetics; pronunciation and diction; special problems.</td>
</tr>
<tr>
<td>431 French Literature of the Eighteenth Century 3</td>
<td>Prereq Fren 322, 323, or 334. French Enlightenment; selected writings of Montesquieu, Voltaire, Diderot, Rousseau, and others. (a/y)</td>
</tr>
<tr>
<td>441 French Literature of the Nineteenth Century 3</td>
<td>Prereq Fren 322, 323, or 334. Authors and movements of the century; the Romantic, Parnassian, and Symbolist poets.</td>
</tr>
<tr>
<td>442 French Literature of the Nineteenth Century 3</td>
<td>Prereq Fren 322, 323, or 334. Authors and movements of the century; the Romantic, Realist, and Naturalist prose writers.</td>
</tr>
<tr>
<td>451 French Literature of the Twentieth Century 3</td>
<td>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)</td>
</tr>
<tr>
<td>452 French Literature of the Twentieth Century 3</td>
<td>Prereq Fren 322, 323, or 334. Contemporary authors and movements; pre-surrealism, Apollinaire, contemporary poetry; new theater, existentialism, nonveu romant, modern critics and essays. (a/y)</td>
</tr>
<tr>
<td>480 Seminar in French Language or Literature 3</td>
<td>May be repeated for credit. Prereq Fren 322, 323, 333, or 334.</td>
</tr>
<tr>
<td>499 Special Problems V 1-4</td>
<td>May be repeated for credit.</td>
</tr>
<tr>
<td>501 Seminar in Medieval or Sixteenth Century French Literature 3</td>
<td>May be repeated for credit; cumulative maximum 6 hours. Selected works from the earliest texts to 1500, or Renaissance authors. (a/y)</td>
</tr>
<tr>
<td>521 (511) Seminar in Seventeenth or Eighteenth Century French Literature 3</td>
<td>May be repeated for credit; cumulative maximum 6 hours. Selected works from the seventeenth and eighteenth centuries. (a/y)</td>
</tr>
<tr>
<td>522 Stylistics 2</td>
<td>Near-native ability developed through a comprehensive study of French style.</td>
</tr>
<tr>
<td>530 Advanced Intensive French for Graduate Students 6</td>
<td>(3-9) Prereq Fren 303. Continuation of Fren 303. (SS)</td>
</tr>
<tr>
<td>541 (523) Seminar in Nineteenth Century French Literature 3</td>
<td>May be repeated for credit; cumulative maximum 6 hours. Selected works from the nineteenth century. (a/y)</td>
</tr>
<tr>
<td>551 Seminar in Twentieth Century French Literature 3</td>
<td>May be repeated for credit; cumulative maximum 6 hours.</td>
</tr>
<tr>
<td>580 Graduate Seminar 3</td>
<td>May be repeated for credit.</td>
</tr>
<tr>
<td>598 Instructional Practicum I</td>
<td>May be repeated for credit; cumulative maximum 4 hours. Responsibilities, grading, instructional methods, and materials.</td>
</tr>
<tr>
<td>600 Special Projects or Independent Study Variable credit.</td>
<td></td>
</tr>
</tbody>
</table>

**German**

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 for enrichment in basic German; continuation of Ger 103.²

203 Third Semester German 4 Prereq Ger 102. Cultural readings and expansion of grammatical concepts.¹

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.¹ (SS)

304 Intermediate German 4 Prereq Ger 203. Selected German texts in a cultural context; continued practice in spoken and written German.¹

315 Germanic Civilization 2 The cultural development of the Germanic peoples to 1750; readings, lectures, and discussions in English.

316 German Culture and Civilization 2 The cultural development of Germany from 1750 to the present; readings, lectures, and discussions in English.

317 Contemporary Culture and Society 2 Lectures, readings, and discussions in English; current social, political, economic, and cultural trends in Germany.

¹Not open to native speakers.

²Will not satisfy foreign language requirements of College of Sciences and Arts.
318 Topics in German Civilization 3 Study abroad (Cologne).
322 Composition and Conversation 3 Prereq Ger 304. Intensive practice in speaking and writing formal German.¹
323 Composition and Conversation 3 Prereq Ger 304. Continuation of intensive practice in conversation and formal writing skills.¹
333 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 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.¹
420 Advanced Composition and Conversation 3 Prereq Ger 322 or 323. Development of proficiency in writing skills; emphasis on fluency and accuracy.¹
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 Nineteenth 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 Literatures 5 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)
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 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours Responsibilities, grading, instructional methods and materials.
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
Ital
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. (SS)

Japanese
Japn
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 (SS)
304 Basic Japanese 5 Provides active knowledge of listening to, speaking, reading, and writing Japanese. For stu-

¹Not open to native speakers.
Department of Foreign Languages and Literatures

dents with little or no experience in Japanese. (SS)


401 Japanese III 4 Prereq Japn 302. Conversation and reading of selected texts.1

Russian

Rus

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 speaking, reading, and writing Russian.1

203 Third Semester Russian 4 Prereq Rus 203. Grammar review and further development of speaking, reading, and writing skills.

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 (SS)

304 Intermediate Russian 4 Prereq Rus 203. Reading and discussion of selected texts in their cultural context; brief grammar review. Continued practice in spoken and written Russian.1

315 Russian Civilization 3 Russian culture to 1917: readings, lectures, and discussions in English.

317 [G] Contemporary Soviet Culture and Society 3 Readings, lectures, and discussions in English; current cultural and social trends in the USSR.

320 Russian Conversation I 2 (0-6) Prereq Rus 304. Practice to improve oral skills.1

321 Russian Conversation II 2 (0-6) Prereq Rus 304.1

350 Russian Literature in Translation 3 May be repeated for credit; cumulative maximum 6 hours. Major works in Russian literature, both 19th century and the Soviet period; in English.

380 Seminar in Russian Language 3 May be repeated for credit; cumulative maximum 6 hours. Application and elaboration of the basic syntactic and stylistic principles of the language. Taught in Russian.

471 Russian Literature of the Soviet Period

3 Prereq Rus 304. Selected works written after 1917. Taught in Russian.

480 Seminar in Russian Literature 3 May be repeated for credit; cumulative maximum 6 hours. Selected works from the 19th and 20th centuries. Taught in Russian.

490 Seminar: Research Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours. Directed research with in-class discussion.

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

600 Special Projects or Independent Study Variable credit.

Spanish

Span

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 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 (SS)

304 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 Hispanic Civilization 3 Spanish culture with lectures and reading in English.

316 Hispanic American Culture 3 Spanish-American culture with lectures and readings in English.

318 Topics in Latin American Civilization 3 Study abroad (Guadalajara)

320 Spanish Conversation 1 (0-3) May be repeated for credit; cumulative maximum 4 hours. Prereq Span 304. Opportunity to converse in small groups with native informants.1

321 Pronunciation of Spanish 1 (0-3) Prereq Span 203. Pronunciation of basic Spanish sounds.

322 Advanced Grammar 2 Prereq Span 304.

1Not open to native speakers.
Recommended for those intending to take the upper-level composition or conversation courses.

323 Intensive Oral Spanish 2 Prereq Span 304. Practice in the use of conversational Spanish in formal and informal contexts.

324 Spanish for Chicanos I 3 Prereq fluency in Span. Readings of Chicanos writers; composition, grammar.

325 Spanish for Chicanos II 3 Same as Ch St 325.

326 Spanish Composition 2 Prereq Span 304. The writing of formal and informal Spanish.

330 Advanced Intensive Spanish for Undergraduate Students 6 (3-9) Prereq Span 303. Continuation of Span 303. (SS)

333 Masterpieces of Spanish and Spanish-American Literature 3 Prereq Span 304. Reading and discussion of outstanding literary works of Spanish and Spanish-American literature.

350 Spanish Literature in English 2 May be repeated for credit. Lectures and readings in English of selected topics and writers from Spain and Spanish America.

422 Seminar in Literature of the Spanish Golden Age 3 Prereq Span 304. Reading and discussion of representative works of the Spanish Golden Age.

423 Advanced Conversational Spanish 2 Prereq Span 304. Practice of the use of conversational Spanish in formal and informal contexts.

425 Seminar in Cervantes 3 Prereq Span 304. Quixote plus selected other works.

426 Advanced Spanish Composition 2 Prereq Span 304. Writing of formal and informal Spanish.

442 Spanish Literature of the Nineteenth Century 3 Prereq Span 304. Drama, poetry, the short story, the costumbre, sketch, and the novella in 19th century Spain.

450 The Generation of 1898 and Modernism 3 Prereq Span 304. Reading and discussion of representative works by Peninsular writers of the early 20th century.

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. (SS)


580 Graduate Seminar 3 May be repeated for credit. Prereq Span 304.

598 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Responsibilities, grading, instructional methods 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

Swed

301 First Semester Swedish 4 Speaking, reading, and writing Swedish.

302 Second Semester Swedish 4 Continuation of Swed 301.

350 Scandinavian Literature in English 2 May be repeated for credit. Scandinavian literature from Ibsen and Strindberg to the present.

Schedule of Studies

At least 40 of the total hours required for the

1Not open to native speakers.
bachelor's degree in this program must be in upper-division courses.

A minimum of 26 hours (beyond 203-level) 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, 333, 420, plus 11 hours from 316, 333, 401 (maximum 1 hr), 432, 435, 442, 451, 452, 460, 480.

**Russian:** 304, 315 plus 19 hours from 320, 321, 380, 471, 480, 499.

**Spanish:** 304, 315 or 316, 322, 323, 326, 333 plus 10 hours from 320 (maximum 2 hrs), 321, 422, 423, 425, 426, 442, 450, 451, 471, 472, 474, 480.

**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 taken pass-fail may not be included for credit toward the minor.

**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 Require-
ments, 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.

**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.

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**Department of Forestry and Range Management**


The department offers programs in forest management, range management, and wildlife recreation leading to the degrees of Bachelor of Science in Forest Management, Bachelor of Science in Range Management, Bachelor of Science in Wildlife and Wildland Recreation Management, and Master of Science in Forest and Range Management.
The department also participates in inter-
departmental programs leading to the degrees
of Bachelor of Science in Environmental Sci-
ence and Master of Science in Environmental
Science.

Bachelor's Program
The undergraduate program is designed to pro-
vide the knowledge and training necessary for
a professional career managing forests, range
lands, and wildlands or dispersed recreation
areas. 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 re-
quirements set forth by the university, U.S.
Office of Personnel Management, Society of
American Foresters, Society for Range Manage-
ment, 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 wild-
land recreation. Before the junior year a stu-
dent will choose an option to complete the
basic or "core" curriculum. The options for
forest and range management are common
to both, while wildland recreation has a sepa-
rate set of options.

All students majoring in forest management,
range management or wildland recreation are
required to successfully complete 128 hours of
course work (exclusive of physical education
activity courses), to earn the Bachelor of Sci-
ence degree. At least 40 of the total hours re-
quired for the bachelor's degree must be in
upper-division courses.

Between the junior and senior years all
students (except wildland recreation majors)
will work for a professional oriented organi-
zation 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 pub-
lic land management agencies and private in-
dustry.
problems; planning and coordinating timber harvesting with forest management.

321 Wood Structure and Properties 3 (2-3) Prereq Bio S 103. Anatomy of woody plants, identifying characteristics, and properties of woods; relation of wood properties to processing and use. Field trips required. Cooperative course taught at the University of Idaho (For Pr ID 331).

330 Wildland Fire Management 3 Causes, behavior, and effects of wildland fires, techniques of prevention, suppression and suppression; use 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 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.

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, 372. Fundamentals and practices in interpreting wildland biological and physical phenomena as related to public recreation. Field trip required. (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 or range management. Integration of summer employment in professionally directed programs with formal courses and summer reading assignments. (SS)

400 Professional Development II 1 Prereq FRM 399. Integration of summer professional experience with curriculum.

402 Forest Station 3 (2-3) Prereq FRM 304, 305. Nursery planting, seed and seeding problems, intermediate stand treatments, field trips required. Credit not granted for both FRM 402 and 502.

403 Principles of Public Land Management Planning 3 Federal and Washington state land management planning processes, inventory techniques, public involvement, plan implementation, and monitoring programs. Field trip required. Credit not granted for both FRM 403 and 503.

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 Math 107. 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.

432 Low Volume Forest Roads 3 Prereq FRM 320. Road classification; design of forest roads; construction technique; costing, environmental considerations, design project. Three days of field trips. Cooperative course taught at the University of Idaho (For Pr ID 432).

433 Forest Tractor System Analysis 3 Prereq FRM 320. Planning, layout, and
cost analysis of forest tractor systems, production estimating, machine capabilities, and options; layout project. Three days of field trips. Cooperative course taught at the University of Idaho (For Pr Pr ID 433).

434 Cable Systems Analysis 3 Prereq FRM 320. Layout, planning, and design for cable logging systems; analysis of forces involved in cable logging; crew and terrain reqs; layout and design project; cost and equipment analysis. Three 1-day field trips. Cooperative course taught at the University of Idaho (ForPr ID 434).

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.

455 Applied Problems in Range Economics 1 (0-3) Prereq Ag Ec 340. Applications of economic analysis to range management problems.

456 Range and Ranch Planning 3 (2-3) Prereq FRM 452; Ag Ec 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. Field trips required. Credit not granted for both FRM 471 and 571. (a/y)

472 Dispersed Recreation Management 3 (2-3) Prereq FRM 471. Inventory systems, monitoring and assessing resources and social impacts associated with dispersed recreational use of wildlands. Field trips required. Credit not granted for both FRM 472 and 572. (a/y)

474 Public Management in Wildland Recreation 3 Prereq FRM 371, 372. Theory issues, and techniques for managing public use in dispersed recreation settings. Field trips required. Credit not granted for both FRM 474 and 574. (a/y)

478 Wildland Recreation Planning 3 (2-3) Prereq FRM 301, 371, 471. Comprehensive area and development planning for wildland recreation and amenities in multiple-use and single-use settings. Field trips required. Credit not granted for both FRM 478 and 578. (a/y)

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 301, 330. 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, 402. Current problems of special silvicultural interest. (a/y)

502 Forestation 3 (2-3) Graduate level counterpart of FRM 402; additional requirements. Credit not granted for both FRM 402 and 502.

503 Principles of Public Land Management Planning 3 Graduate level counterpart of FRM 403; additional requirements. Credit not granted for both FRM 403 and 503.

511 Advanced Forest Economics 2 Prereq FRM 411. Economic principles, legislation, and policies affecting forestry; character and intensity of land use. Cooperative course taught at the University of Idaho (For ID 581).

512 Economics of Timber Demand and Supply 3 Prereq FRM 511. Economic analysis of factors affecting demand for and supply of public and private timber and related forest products. (a/y)

514 Forest Tree Improvement 3 Same as GenCB 514.

515 Quantitative Techniques in Land Management 3 Prereq FRM 403, Biom 310, 412, or QMeth 215. Assumptions and limitations of quantitative methods and their application in land management planning.
516 Management of NIPF Lands in the Pacific Northwest 3 Prereq FRM 415. Importance, problems, and opportunities for management of nonindustrial private forests in the Pacific Northwest. Field trips required. (a/y)

517 Advanced Forest Measurement 1 Prereq enrollment in CEFS 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.

525 Experimental Plant Ecology 3 (1-6) Experimental techniques in plant ecology with orientation toward environmental and physiological measurement in both field and laboratory research.

543 Population Management 2 (1-3) Same as Entom 543. (a/y)

545 Advanced Forest Environments 4 Prereq enrollment in CEFS program. Meteorology, soils, and vegetation classification 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 concepts 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 management.

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 influencing wildland productivity and management for different goods and services.

571 Wildland Recreation Management 3 (2-3) Graduate level counterpart of FRM 471; additional requirements. Credit not granted for both FRM 471 and 571. (a/y)

572 Dispersed Recreation Management 3 (2-3) Graduate level counterpart of FRM 472; additional requirements. Credit not granted for both FRM 472 and 572. (a/y)

574 Public Management in Wildland Recreation 3 Graduate level counterpart of FRM 474; additional requirements. Credit not granted for both FRM 474 and 574. (a/y)

578 Wildland Recreation Planning 3 (2-3) Graduate level counterpart of FRM 478; additional requirements. Credit not granted for both FRM 478 and 578. (a/y)

581 Big Game Habitat Studies 1 (0-3) Prereq FRM 480; 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 Management 1 May be repeated for credit. Literature review; preparation and presentation of reports in forestry and range science.

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.

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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</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Spe 102 or AgHE 205</td>
<td>3</td>
</tr>
<tr>
<td>Engl 402 Tech Writing</td>
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<tr>
<td>Bio S 103 and 104 or Bot 120</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>
<td>4</td>
</tr>
<tr>
<td>Chem Principles</td>
<td>7-8</td>
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<tr>
<td>Math 107, 202; or 107, 108, 140; or 107, 108, 171</td>
<td>6-9</td>
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</table>
Econ 203 or Ag Ec 201 3
Geol 102 Phys Geol 4
Soils 201 Soils 3
Soils 372 Air Photo Interp 2
Biom 310 or QMeth 215 3
FRM 100 Intro For & Rg Mgt 1
FRM 204 Silvics 1
FRM 300 Prof Development I 1
FRM 301 For & Rg Envir 3
FRM 302 Adv For & Rg Envir 3
FRM 304 Silviculture 2
FRM 305 Fld Studs in Silv 1
FRM 311 For & Rg Econ 3
FRM 312 Mensuration 4
FRM 320 Timber Harvesting 3
FRM 330 Wildland Fire Mgt 3
FRM 399 Prof Integration 1
FRM 400 Prof Development II 1
FRM 411 Finance and Valuation 3
FRM 412 Policy and Admin 3
FRM 415 Forest Mgmt 4
FRM 351, 371, or 460 3
Soc S Elective 3
Hum Electives 6

**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, 402; two additional courses from FRM 351, 371, 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, 451, 480; Zool 224; Zool 328, 435; 8 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 Society of Range Management 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 range students are required to take the following courses:

Enrl 101 Composition 3
Enrl 402 Tech Writing 3
Bio S 103 and 104 or Bot 120 8
Math 107, 202; or 107, 108, 140; or 107, 108, 171 6-9
Chem Principles 8-10
A S 101 or 175 and 176 2-3
A S 213 3
Spe 102 or AgHE 205 3
Chem 240 Organic 4
Soils 201 Soils 3
Soils 372 Air Photo Interp 2
Soils 404 Morphology 3
Bot 332 Systematic 3
Bot 320 Plant Phys 3
Econ 203 or Ag Ec 201 3
Biom 310 or QMeth 215 3
Cpt S 150 and 151 or 153 4
Ag Ec 340 Intro Farm Ranch Mgmt 3
FRM 100 Intro For & Rg Mgt 1
FRM 204 Silvics 1
FRM 300 Prof Development I 1
FRM 301 For & Rg Envir 3
FRM 302 Adv For & Rg Envir 3
FRM 304 Silviculture 2
FRM 305 Fld Studs in Silv 1
FRM 330 Wildland Fire Mgmt 3
FRM 351 Principles of Rg Mgmt 3
FRM 352 Rg Livestock Mgt 3
FRM 354 Range Plant Comm 3
FRM 399 Prof Integration 1
FRM 400 Prof Development II 1
FRM 412 For & Rg Pol 3
FRM 451 Range Habitat Anal 3
FRM 452 Range Development & Imp 3
FRM 455 App Prob in Rg Econ 1
FRM 456 Range and Ranch Planning 3
FRM 480 Big Game Hab Mgmt 3
Hum Electives 6
Soc S Elective 3

**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, 328, 435; 8 credits zoology and wildlife electives approved by adviser.

**Directed Studies.** 18-23 hours related course work approved by adviser and department
Wildland Recreation Core Requirements

The wildland recreation curriculum leads to the Bachelor of Science degree in Wildlife and Wildland Recreation 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 forestry, state parks, interpretation, dispersed recreation management 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. During the senior year all majors are required to enroll in at least one semester hour of FRM 499; an approved proposal is required before enrolling. The senior thesis focuses on appropriate summer employment with a land management agency, or a field study, or library research. It should demonstrate the application of knowledge to a problem or situation in wildland recreation management.

All wildland recreation students are required to take the following courses:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRM 100</td>
<td>Intro For &amp; Rg Mgmt</td>
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<tr>
<td>FRM 204</td>
<td>Silvics</td>
<td>1</td>
</tr>
<tr>
<td>FRM 230</td>
<td>Prn Renew Res Mgmt</td>
<td>3</td>
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<tr>
<td>FRM 301</td>
<td>For &amp; Rg Envir</td>
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</tr>
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<td>FRM 302</td>
<td>Adv For &amp; Rg Envir</td>
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<tr>
<td>FRM 304</td>
<td>Silviculture</td>
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<td>FRM 305</td>
<td>Silv Lab</td>
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<td>FRM 371</td>
<td>Wild Rec</td>
<td>3</td>
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<td>FRM 372</td>
<td>Wild Rec Field Lab</td>
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<td>FRM 373</td>
<td>Interp Tech</td>
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<tr>
<td>FRM 403</td>
<td>Prn Pub Lnd Mgmt Plan</td>
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<tr>
<td>FRM 471</td>
<td>Wild Rec Management</td>
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<td>FRM 472</td>
<td>Dispersed Rec Mgmt</td>
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<td>FRM 478</td>
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<tr>
<td>FRM 499</td>
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<td>Geol</td>
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<td>Bio</td>
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<tr>
<td>Bot</td>
<td>332 Sys Bot</td>
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<tr>
<td>Bot</td>
<td>462 Synecology</td>
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<td>Pol S</td>
<td>440 Intro Pub Admin</td>
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<td>Math</td>
<td>107 Precal Alg</td>
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<td>Engl</td>
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<td>Ag E</td>
<td>201 Econ in Agric</td>
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<tr>
<td>Env S</td>
<td>444 Envir Impact Statement</td>
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</table>

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 12-18 semester hours to the core curriculum. Options are available in the following areas:

Forestry: FRM 312, 411 and electives approved by adviser.

State Parks: Crm J 101, 210, L A 264 and electives approved by adviser.


Dispersed Recreation Management: Bot 463, Soils 415, Zool 310, 335 and electives approved by adviser.

Directed Studies: 12-18 hours of related course work approved by adviser and department chair 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.

**Department of General Agriculture and Home Economics**

*Professor and Acting Department Chair, R. E. Young; Professors, J. G. Cvancara, T. F. Traill; Associate Professors, R. M. Jimmerson, J. S. Long, B. L. Trout; Assistant Professors, W. L. Holmes, B. J. Johnson, M. D. Kleene.*

The Department of General Agriculture and Home Economics offers six undergraduate majors: agricultural communications, agricultural education, general agriculture, general home economics, home economics education, and integrated pest management. In addition, preparation for international service is available.

The Department of General Agriculture and Home Economics offers majors leading to the degrees Bachelor of Science in Agriculture and Bachelor of Science in Home Economics.

**Description of Courses**

*For explanation see Index under "Symbols"*

**General Agriculture and Home Economics**

*AgHE*

205 [C] Human Relations in Agriculture and Home Economics 3 (2-3) Developing and understanding of human behavior and leading skills in communication and leadership.

305 Leadership Development in Agriculture and Home Economics 3 Prereq AgHE 205. Theories and principles of leadership; skill development and application of principles.

342 Methods of Teaching Agriculture 2 Prereq Educ 301. For juniors and seniors. Curriculum development and instructional strategies for teaching agriculture.

343 Methods of Teaching Home Economics 3 Prereq Educ 303 or c//; 18 hrs H E. Curriculum development and instructional strategies for teaching home economics.

345/346 Industrial Safety and Hygiene 1 Same as 1 Tec 345/346.

405 Public Policy in Agriculture and Home Economics 3 Prereq AgHE 305. Roles, skills and relationships of individuals in the formation and implementation of policy in agriculture and home economics.

407 Directed Teaching, Agriculture and Home Economics 4 May be repeated for credit. Prereq AgHE 342, 343, 434, 442; c// in Educ 405/406. By interview only. Supervised teaching in public schools for agricultural education and home economics education majors.

434 Home Economics Education 2 Prereq AgHE 343; c// in Educ 405/406. Organization and administration of vocational programs in home economics.

440/441 Principles of Vocational Education 2 or 3 Same as 1 Tec 440/441.

442 Program Planning in Agricultural Education 2 Prereq AgHE 342. Organization and management of a total vocational agricultural program.

443 Current Issues in Agriculture and Home Economics 3 Analysis of facts, positions, policies, and public interests related to current critical issues in agriculture and home economics.

444 Rural Development in International Agriculture and Home Economics 3 Theory, principles, and rural development issues in international agriculture and home economics.

470 Direct Work Experience 1-3 May be repeated for credit; cumulative maximum 6 hours. Same as 1 Tec 470.

471 (VTE 471) Student Organizations 2 Same as 1 Tec 471.

497 Agriculture/Home Economics Internship V 2-4 By interview only. Off-campus professional experience in agriculture and home economics industries.

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

**Integrated Pest Management**

*IPM*

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 max-
minimum 7 hours. By interview only. Supervised individual practicum with IPM-oriented businesses, organizations, and governmental agencies; professionally related field interaction.

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)

AGRICULTURAL COMMUNICATIONS

Schedule of Studies

A major in agricultural communications is offered in the Department of General Agriculture and Home Economics, in cooperation with the Department of Communications, leading to the degree 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: Com 225; Jour 305; Com 253; P R 313, 413; Com 490, and 9 elective hours in the Department of Communications.

Broadcast Media: Com 165, 225, 255, 355, 365; P R 312, 413; Com 490, and 9 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.

AGRICULTURAL EDUCATION

Schedule of Studies

The agricultural education major prepares students to teach high school vocational agriculture. A minimum of 54 hours in agricultural sciences is required for graduation.

This course of study leads to the degree Bachelor of Science in Agriculture. The program includes minimum requirements for both the Provisional Teaching Certificate and the Vocational Agriculture Education Certificate.

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. The program requires a minimum of 130 semester hours for graduation.

**Freshman Year**

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
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<tr>
<td>Engl 101</td>
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<tr>
<td>Hort 101/201</td>
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<td>Elective or Math 101</td>
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<table>
<thead>
<tr>
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<th>Hours</th>
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<td>Ag Ec 201</td>
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<tr>
<td>Chem 102</td>
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<tr>
<td>Hum Elective</td>
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<tr>
<td>Psych 102</td>
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<tr>
<td>Soils 201</td>
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**Sophomore Year**

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<td>Ag M 201</td>
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<tr>
<td>A S 213</td>
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<td>Bio S 103</td>
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<td>Ag M 203</td>
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<td>Agron 250</td>
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<td>Bio S 104</td>
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<tr>
<td>Hum Elective</td>
<td>3</td>
</tr>
</tbody>
</table>
### Junior Year

**First Semester**
- Ag M (upper division) 3
- Ag Ec 350 4
- Educ 301 2
- IPM 201 2
- Educ 500 (Sept Exp) 1
- Soils 301 2
- AgHE 471 2

**Second Semester**
- Ag M (upper division) 3
- Ag M 313 1
- Ag Elective 3
- Educ 402 2
- Agron (upper division) 3
- Entom 340 2
- Educ 338 2

### Sophomore Year

**First Semester**
- Chem 102 or 106 4
- Bio 103 Introductory 4
- Spe 102 or Hum Elective 3
- Ag Ec 201 3
- Elective 2-3

**Second Semester**
- Bio 104 or Bot 201 4
- Hum or Soc S Elective 3
- AgHE 205 or Spe, Engl, Com Elective 3
- Soils 201 3
- Ag Elective 2-3

### Junior Year

**First Semester**
- PI P 329 or IPM 201 3
- Biom 310 or 412 3
- Ag Ec 3
- Elective 5

**Second Semester**
- AgHE 305 3
- Entom 340 Ag Entom 3
- Ag Elective 6
- A S 213 3

### Senior Year

**First Semester**
- Ag M 3
- Agron 305 Weeds 3
- Soils 301 Soil Mgmt 2
- Elective 7

**Second Semester**
- Electives 14

### General Agriculture

**Schedule of Studies**

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 emphasize one or two fields, or otherwise to tailor the curriculum to fit particular needs.

**Freshman Year**

**First Semester**
- Engl 101 Composition 3
- Math 101, 107, 109, 140, 201 3-4
- Ag Elective 6
- Hum Elective 3

**Second Semester**
- Chem 101 or 105 4

- Hum or Soc S Elective 3
- Econ 101 3
- Ag Elective 5-6

### General Home Economics

**Schedule of Studies**

The undergraduate major in general home economics is designed for students who wish to prepare for careers requiring broad training in the total field of home economics. A minimum of 60 semester hours of course work...
in child and family studies, clothing and textiles, interior design and human nutrition and foods is required. A maximum number of electives is permitted to enable the student to specialize in one or two fields such as business, communications, general science, social science or international development, or otherwise tailor the curriculum to fit particular needs.

Required Courses

General University Requirements—38 hrs
Engl 101 Composition 3
Comm Prof Elective 3
Arts and Hum Electives 6
Soc 101 Introduction 3
Psych 102 Introduction 3
Econ 201 Principles 4
Bact 101 Elem Bact 4
Chem 101 or 105 4
Zool 251 Intro Hum Physiol 4
Electives 4

Home Economics Core Requirements—42 hrs
CFS 247 Hum Development II 3
CFS 240 Hum Development I 3
CFS 242 Directed Observation 1
CFS 350 Decision Making 3
CFS 353 Family Housing 3
CFS 450 Management Experience 2
CFS 352 or 452 3
ID 101 Basic Environment Design 3
CT 215 Textiles 3
CT 216 Cloth Construction 3
CT 217 Intro to Clothing 2
Fshn 120 or 220 3
Fshn 130 or 333 3
Fshn 266 Household Equip 3
Home Economics Elective 4

Home Economics Major/Minor Emphasis—20 hrs
Child and Family Studies
Clothing, Interior Design, Textiles
Human Nutrition & Foods

Non-Home Economics Support Area—20 hrs
Business
Communications
Physical Science
Social Science
International Development

HOME ECONOMICS EDUCATION

Schedule of Studies

The Home Economics Education major leads to the degree Bachelor of Science in Home Economics. The program includes minimum requirements for both the Provisional Certificate and the Vocational Home and Family Life Education Certificate.

At least 40 of the total hours required for the bachelor's degree in this major must be in upper-division courses. A minimum of 42 hours of home economics subject matter (CFS, CIDT, FSHN) are required for graduation.

<table>
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<tr>
<td>Engl 101 Composition</td>
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<td>Comm 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>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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<td>CFS 350 Decision Making</td>
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<td>CFS 353 Family Housing</td>
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<td>CT 215 Textiles</td>
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<td>CT 216 Cloth Construction</td>
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<td>CT 217 Intro to Clothing</td>
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<td>Fshn 130 or 333</td>
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Option A (in addition to required courses above): Chem 101 or 105—4 hours; Chem 240—4 hours.

Option B (in addition to required courses above): Soc 270, 330, 331, 351, or Econ 312 or Anth 301—3 hours; social science elective—3 hours.
INTEGRATED PEST MANAGEMENT
Schedule of Studies

The integrated pest management major is a multidisciplinary course of study sponsored by the Department of Agronomy and Soils, Entomology, Horticulture and Landscape Architecture, and Plant Pathology and coordinated through the General Agriculture and Home Economics Department. 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 both of the areas of entomology, 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.

All students are required to complete a minimum of 120 semester hours of course work, including the internship, to earn the Bachelor of Science degree in Agriculture. At least 40 of the total hours required must be in upper-division courses.

Freshman Year

First Semester
- Bio S 103 Introduction 4
- Chem 101 or 105 4
- Engl 101 Composition 3
- IPM 201 Intro Pest Mgmt 2
- Hum Elective 3

Second Semester
- Bot 201 or Bio S 104 4
- Chem 102 or 106 3-4
- Math 107 or 140 3-4
- Psych 101 Introduction 3

Junior Year

First Semester
- Agron 305 Weeds 3
- Biom 310 Agric Stat 3
- Bot 320 Intro Plant Phys 3
- PI P 329 Gen Plant Path 3
- Elective/Option Course 3

Second Semester
- Bio S 372 Gen Ecol 4
- Bot 332 Intro Sys Bot 4
- Entom 340 Agric Entom 3
- IPM 452 Pesticides Env 2
- PI P 405 Dis WA Crops 3

Summer Session
- IPM 399 Pest Mgt Intern 3

Senior Year

First Semester
- Electives/Option Courses 15

Second Semester
- Hort 417 Plt Pest Contr 3
- IPM 462 Sys Pest Mgmt 3
- Electives/Option Courses 9

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.

Weed Science Option. Students must take the above courses plus the following: Agron 301, 302, 303, 345.

INTERNATIONAL SERVICE

Many students want to work in international development. Excellent preparation is possible for temporary or interim assignments or for lifetime careers in serving as agriculturists, home economists, or educators overseas. Twenty semester hours chosen from the following list will, along with the General Agriculture and Home Economics curriculum, help prepare the student for international service.

AgHE 444, ACE 530, 540, Ag Ec 420; Anth 101, 203, 301; Bact 101; Econ 416, 470, 472, Env S 101; FSHN 130; GenCB 201; Geol 101; Pol S 102, 222, 423, 427; Psych 101, 102, 350; Soc 101, 270, 330, 371; For L elective.
Program in General Biology

Professor and Program Head, W. R. Rayburn; Professors, J. L. Hindman, R. J. Jonas, R. N. Mack, L. P. Mallavia, K. D. Spence; Associate Professors, E. S. Broch, J. W. Crane, K. V. Kerdong, H. A. Went, G. J. Williams, G. L. Young; Associate in Teaching, J. C. Horne.

The introductory biological science courses provide background in the concepts common to life sciences and an overview of the diversity of animals, plants, and microorganisms. They meet General University Requirements and may be prerequisite for courses in bacteriology, botany, and zoology. Advanced biological science courses probe specific areas in depth.

This program leads to the degree of Bachelor of Science in Biology and Master of Science in Biology.

Five options are available for the Bachelor of Science degree: botany, general biology, genetics and cell biology, biology education, and pre-physical therapy. A minor in biology is offered.

Description of Courses

For explanation see Index under "Symbols"

Bio S

101 [B] Direction in Biological Sciences 3 Understanding biology as a science and its effect on issues within society. 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) Pre-req 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) Pre-req 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.

201 Contemporary Biology 1 Prereq Bio S 101, 102, 103, Bact 101, or Bot 120. Biological information that provides a framework for understanding life processes; impact of biological information on human affairs.


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 teaching secondary school science courses.

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.

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.

Schedule of Studies

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

All majors are required to take the following courses: Bio S 103 and 104; Chem 105, 106, 107 and 240; Math 107 and 108; Phys 101 and 102.

In addition to the above requirements, students selecting one of the following options:

General Biology Option: Math 140 or 171, GenCB 301, BC/BP 364, Bio S 372, Bot/Zool 405, Bot/GenCB/Zool 450 and additional hours in biological science courses to total 40 hours.

Biology Education Option: GenCB 301, BC/BP 364, Bio S 372, Bot/Zool 405, Bio S 430, Bot/GenCB/Zool 450 and additional hours in biological science courses to total 35 hours.

Geol 101 for Junior High candidates; Educ
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 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

B. Lentz, 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 science 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 ap-
General Studies

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 complete (1) the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) 120 semester hours which normally includes 40 or more at the upper-division level, (3) a second year (or its equivalent) of Greek or Latin language,

(4) 36 hours including:

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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>
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<tr>
<td>Hist 341</td>
<td>Rome: Rep &amp; Emp</td>
<td>3</td>
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<tr>
<td>Hum 100</td>
<td>Mythology</td>
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<td>Hum 101</td>
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<td>Hum 301</td>
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<td>Phil 300</td>
<td>Anc &amp; Med Phil</td>
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(5) 17 hours from

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<td>Anth 336</td>
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<td>Engl 308</td>
<td>Intr Lit Crit</td>
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<td>F A 202</td>
<td>Art Western Civ</td>
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<td>F A 301</td>
<td>Classical Heritage</td>
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<td>Hist 381</td>
<td>Sci West Civ</td>
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<td>Pol S 437/Hist 488</td>
<td>Class Pol Thot</td>
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<tr>
<td>Hist 440</td>
<td>Early Middle Ages</td>
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</tbody>
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Additional Greek and Latin beyond the basic language requirements, appropriate seminars, special offerings, and independent study from associated departments must be selected 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

B. Lentz, Coordinator

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, (4) achieve at least a 2.00 g.p.a. in program course work, and (5) complete 21 of the 39 hours required for each option, at the 300-400 level.

Plan A. A concentration of courses at least 24 credits in a single academic department (humanities or social sciences) or special curriculum, and a minor concentration of at least 15 credits in another department or special curriculum.

Plan B. A combination of humanities courses of at least 39 credits involving three or more academic departments, with a minimum of 9 hours in each area.

Plan C. A combination of social science courses of at least 39 credits involving three or more academic departments, with a minimum of 9 hours in each area.

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 and College of Sciences and Arts 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 of 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, 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:** 6 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, 24 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, 405, 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 and 310; Phil 107, 300, 314, 315, 407, 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, A. Kleinhofs, Professors, H. L. Hostick, C. F. Konzak, R. A.

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, molecular genetics, cell biology, biochemical and developmental genetics, mutagenesis, cytogenetics, population and quantitative genetics, and wheat and barley 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 allows them to act as advisers for graduate students majoring in Genetics and Cell Biology. Cooperaing departments include Agronomy and Soils, Animal Sciences, Bacteriology and Public Health, Biochemistry and Biophysics, Botany, 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 neo-plastic progression, mechanisms of flagellar and ciliary motion, chromosome evolution in fish, mathematical modeling of genome and mobile genetic element evolution, population genetic models of kin selection and genetic variation, and evolution in geographically structured populations.

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 and animals.

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 recombinant DNA area, 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 biotechnology and plant and animal breeding, and in some cases in specialized medical research.

**Description of Courses**

*For explanation see Index under "Symbols"*

**GenCB**


402 General Genetics Laboratory 2 (0-6) Prereq GenCB 301 or c/. Basic principles of modern and classical genetics utilizing several species.

430 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.

462 Microbial Genetics 3 Same as Bact 462.

485 Molecular Genetics 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 (Bact ID 485/585). (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 Eukaryotic Molecular Genetics 2 Prereq GenCB 301. Gene control and organization; lower eukaryotic and cell culture 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. (a/y) Cooperative course taught at the University of Idaho (For ID 527).

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. (a/y) Cooperative course taught at the University of Idaho (For/Genet ID 528).

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. (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 564. Biochemical description of genetic processes in microorganisms.

562 Mathematical Genetics 3 Same as Stat 562. (a/y)

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)

575 Molecular Biology Techniques I 1 (0-3) Same as BC/BP 575.

576 Molecular Biology Techniques II 1 (0-3) Same as BC/BP 576.

577 Molecular Biology Techniques III 1 (0-3) Same as BC/BP 577.

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, cytology, and cell biology.

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.

Geological Engineering


Geological engineering is an interdisciplinary curriculum of the Department of Geology and the Department of Civil and Environmental Engineering. The bachelor’s degree program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

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 design of engineering structures. Although the undergraduate curriculum is fairly rigid to meet the accreditation standards, some flexibility is available through choice of electives, and students may direct their interests into either geotechnics or geohydraulics.
Because of the ever-increasing knowledge required to practice at high levels of competence in the diverse areas of geological engineering, it is recommended that the student pursue studies through the MS degree.

The course of study lead to the degrees of Bachelor of Science in Geological Engineering and Master of Science in Geological Engineering. Advanced graduate students wishing to specialize in geological engineering may work towards a Ph.D. in geology, civil engineering, or engineering science.

Description of Courses
Description of all courses in the following schedule of studies are given under the individual listings according to the department prefix.

Schedule of Studies

A Bachelor of Science degree in Geological Engineering ordinarily requires a total of 135 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 4
Chem 105 Principles 4
M E 101 Graphic Design 2
Engl 101 Composition 3
Hum Elective 3

Second Semester
Math 172 Calculus II 4
Chem 106 Principles 3
M E 102 Descriptive Geometry 2
C E 101 Intro Surveying 3
Geol 102 Phys Geol 4

Sophomore Year
First Semester
Math 220 Intro Linear Algebra 2
Phys 201 Classical 4
Geol 350 Mineralogy 4
C E 211 Statics 3
Hum Elective 3

Second Semester
Math 315 Dif Eq 3
Phys 202 Classical 4
Cpt S 203 Prog for Engrs 2
C E 212 Dynamics 3
C E 314 Mechanics of Mats 3

Junior Year
First Semester
C E 317 Geotech I 3
Geol 340 Structures 4
Geol 421 Stratigraphy 3
Geol/C E 409 Num Geol 3
Com Prof Elective (Engl 201, 402, SpCom 102) 3

Second Semester
C E 315 Fluid Mechanics 3
Geol/C E 440 Rock Mechanics 3
Geol/C E 430 Geomorphology 3
Geol 306 Intro Petrology 3
Soc S Elective 3
Econ Elective (Econ 102, 201) 3

Summer Session
Geol 308 Field Geol 6

Senior Year
First Semester
C E 417 Geotech II 3
Geol/C E 426 Engr Geol 3
Geol/C E 475 Groundwater 3
C E 351 Hyd Engr 4
Dept Elective 3

Second Semester
Geol/C E 405 Geoph Engr 4
Geol/C E 403 Envir Geol 3
C E 463 Engr Adm/Econ 3
Soc S Elective 3
Dept Elective 3

CERTIFICATION

Freshman students entering the university are placed in the Curriculum Advisory Program (CAP). Each student interested in geological engineering is assigned a geological engineering adviser. The students remain in CAP 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. During CAP and Pre-Engineering tenure, the student will take the prerequisite courses necessary for certification into the Geological Engineering Program.

Transfer students will be accepted for the program only if they have demonstrated adequate proficiency in the courses which they transfer as part of the program curriculum. If less than 50 credit hours of program requirements have been completed, a transfer student may be accepted in the Curriculum Advisory Program, with final consideration of
certification coming after completion of the first three semesters of the program curriculum.

Transfer Students

Students who are planning to transfer to geological engineering at Washington State University from other institutions should coordinate their studies with the program chair to establish an integrated program leading to the bachelor's degree. This is desirable because of sophomore professional requirements, course sequences, and the need for engineering physics and good preparation in mathematics.

Department of Geology

Professor and Department Head, G. D. Webster; Professors, P. R. Hooper, P. E. Rosenberg; Professor Emeritus, R. K. Sorem; Associate Professors, F. F. Foit, Jr., A. J. Watkinson; Assistant Professors, S. L. Dorobek, D. R. Gaylor, P. B. Larson, L. D. Meinert, E. J. Poeter, 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 geologic 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 degrees of Bachelor of Science in Geological Engineering (ABET accredited) 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 students. Modern concepts of earth science; mineral rock, resource, and map study. Field trip required.
306 Introductory Petrology 3 (2-3) Prereq Geol 101 or 102. Hand sample analysis, petrogenesis and field relationships of rocks. Field trip required.
308 Field Geology 6 (0-18) Prereq Geol 306, 340. Detailed geologic mapping of an area; practice in methods of geologic field work. (SS)
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 3 (2-3)
Same as C E 317.
320 Spring Field Trip Preparation 1 May be repeated for credit. Prereq Geol 310. Reading in preparation for geology 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.
340 Geologic Structures 4 (3-3) Prereq Geol 101 or 102. Field trip required.
350 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.
403 Environmental Geology 3 Prereq Geol 102 and 340 or C E 317. Geological hazards and geologic problems associated with human activities. Field trip required.
405 (524) Geophysical Engineering 4 (3-3)
Same as C E 405. Credit not granted for both Geol 405 and 505.

409 Numerical Geology 3 Prereq Cpt S 203; Geol 340 or c/; Stat 360. Analysis of geologic and geological engineering problems using numerical statistical, and computer methods; analyzing spatial data.

410 Invertebrate Paleontology 4 (3-3) Prereq Geol 310. Morphology, classification, evolution, and ecology of fossil invertebrate organisms. Field trip required.

415 Environmental Measurements 3 (1-6) Same as C E 415.

420 Sedimentary Petrology and Sedimentation 3 (2-3) Prereq Geol 310, 355. Sedimentary rock composition and origins applying the fundamental principles of sedimentation.

421 Principles of Stratigraphy 3 (2-3) Prereq Geol 310. Correlation and dating of sedimentary strata; tectonics and sedimentary basins; regional patterns of sedimentation.

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 Igneous Petrology 2 (1-3) Prereq Geol 355. Mineralogy and petrology of igneous rocks, using the polarizing microscope. Field trip required.

462 Metamorphic Petrology 2 (1-3) Prereq Geol 461 or c/. 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.

491 Remote Sensing and Geologic Applications 3 (2-3) Prereq Geol 101 or 102; Phys 102 or 202; Geol 340. Remote sensing techniques and their utilization in geologic studies, air photos, radar, IR, and landart imagery used. Field trip required. Credit not granted for both Geol 491 and 591. (a/y)

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 May be repeated for credit; cumulative maximum 4 hours. By interview only. Theory and practice of laboratory teaching in geology.

505 Geophysical Engineering 4 (3-3) Same as C E 505. Graduate level counterpart of Geol 405; additional requirements. Credit not granted for both Geol 405 and 505.

508 Advanced Field Methods 3 (0-9) May be repeated for credit. Individual instruction in advanced methods of field geology. (SS)

511 Advanced Topics in Paleontology 3 Prereq Geol 410, 420. Advanced problems and new techniques in paleontology from current literature. (a/y)

515 Paleocology 3 Past environments; interrelations of physical and biological factors; changes in the physical environments. (a/y) Cooperative course taught at the University of Idaho (Geol ID 515).

516 Methods in Paleontology and Biostratigraphy 3 (1-6) Prereq Geol 410. Methods of collection, preparation, illustration of paleontologic data; principles of systematic paleontology; statistical graphic data presentation. Field trip required. (a/y) Cooperative course taught at the University of Idaho (Geol ID 516).

518 Biostratigraphy 3 Techniques of correlation of sedimentary rock units and construction of relative time scale, evolution, extinction, biogeography, and animal assemblages. Cooperative course
taught at the University of Idaho (Geol ID 518).

520 Advanced Topics in Sedimentary Rocks 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Geol 420, 421. Modern aspects of sedimentary rocks. (a/y)


522 Coal Geology/Petrology 3 (2-3) Geology and petrology of coal. (a/y)

523 Advanced Topics in Stratigraphy 3 May be repeated for credit. Prereq Geol 421. (a/y)

525 Carbonate Depositional Systems 3 (2-3) Prereq Geol 420. Modern carbonate environments and processes; ancient carbonate rock sequences; carbonate platform-to-basin transitions; diageneis of carbonate rocks. Field trip required.

526 Engineering Geology and Geotechnics 3 Same as C E 526. Graduate level counterpart of Geol 426; additional requirements. Credit not granted for both Geol 426 and 526.

527 Petrology of Sedimentary Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of terrigenous sedimentary rocks. Field trip required. Cooperative course taught at the University of Idaho (Geol ID 527).

528 Petrology of Carbonate Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of limestones and dolomites. Field trip required. Cooperative course taught at the University of Idaho (Geol ID 526).

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 (Geol ID 492).


541 Structural Analysis 3 (2-3) Prereq Geol 340. Structural analysis of complexly deformed rocks in orogenic belts. Field trip required.

550 Advanced Mineralogy 3 Prereq Geol 355; Chem 106. Elements of crystal chemistry and crystal physics.

551 Ore Microscopy and Fluid Inclusion Analysis 3 (0-9) Prereq Geol 355, 470. Ore and alteration mineralogy of major ore deposits; mineral identification, textural interpretation, sample preparation, photomicrography, fluid inclusion analysis. Field trip required.

552 X-Ray Analysis in Geology 3 (2-3) Generation and use of X-rays for geological research; electron microprobe/SEM, X-ray fluorescence and X-ray powder diffraction. (a/y)

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. (a/y) Cooperative course taught at the University of Idaho (Geol ID 575).

562 Advanced Metamorphic Petrology 3 (2-3) Prereq Geol 461, 462. Characterization and genesis of metamorphic rocks. Field trip required. (a/y)

563 Igneous Petrogenesis 3 (2-3) Prereq Geol 560, 581. Chemical and petrologic techniques used to interpret the origin and evolution of igneous rocks. (a/y)

565 Metamorphism 3 (2-3) Prereq Geol 462. Metamorphic minerals, rocks, processes, and facies. Cooperative course taught at the University of Idaho (Geol ID 565).

571 Geochemistry of Hydrothermal Ore Deposits 3 (2-3) Prereq Geol 470, 581 or 582. Ore formation in hydrothermal environments; sulfide mineral stability, water/rock interactions, and stable isotope relationships to altered rocks. Field trip required.

573 Advanced Topics in Economic Geology 2 May be repeated for credit. Prereq Geol 470. Ore-forming process or deposit type combining literature synthesis, theoretical evaluation and field trip inspection.

577 Advanced Groundwater Hydrology 3 Prereq Geol/C E 475. Groundwater flow systems; modeling and resource management.

581 Petrologic Phase Diagrams 3 Interpretation of phase diagrams in igneous and metamorphic petrology. (a/y)

582 Mineral Equilibria 2 Mineral-solution
341 [H] Rome: Republic and Empire 3 History 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.

352 Gandhi and Twentieth Century India 2 Same as For L 352.

360 [H] Foundations of Western Civilization 3 Major ideas and institutions from antiquity to the present which form the basis of Western civilization, presented thematically.

370 History of Blacks in the Western U.S. 3 Same as Bl St 370.

374 [I] Pre-Modern History of East Asia 3 Geographical, socioeconomic, and intellectual influences upon the development of China, Japan, and Korea to the 19th century.

380 History of Medicine 3 Medicine in English-speaking societies, Middle Ages to present; development of medical care as a social institution.

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

385 History of Modern Warfare 3 Warfare in the Western world; interrelationship with non-military institutions in age of nationalism from American and French revolutions through 1945.

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.

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 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 Th cultures and interactions of Nativ 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 Jeffersonian-Jacksonian America 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 Pre req 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 History 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.

434 History of Central America 3 Social and political development in Central America; reasons for dictatorships and radical social changes.

437 Topics in History 3 Study Abroad (Guadalajara)

438 Topics in History 3 Study Abroad (Guadalajara)

439 Seminar in Latin American History 3 May be repeated for credit.

440 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 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.

442 Topics in History 3 Study Abroad (Avignon)

443 Topics in History 3 Study Abroad (Avignon)

444 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 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.

451 Topics in History 3 Study Abroad (London)

452 Topics in History 3 Study Abroad (London)

453 Topics in History 3 Study Abroad (Cologne)

454 Topics in History 3 Study Abroad (Cologne)

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 European Diplomacy Since 1914 3 Credit not granted for both Hist 460 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.

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.

477 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.

480 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.

486 United States Foreign Relations 3 Same as Pol S 427. Credit not granted for both Hist 486 and 586.

487 American Political Thought 3 Same as Pol S 434. Credit not granted for both Hist 487 and 587.

488 Classical Political Thought 3 Same as Pol S 437.

489 Recent Political Thought 3 Same as Pol S 438.

490 Politics of Developing Nations 3 Same as Pol S 435. Credit not granted for both Hist 490 and 590.

497 Seminar 3 May be repeated for credit; cumulative maximum 6 hours.

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


507 American Urban History 3 Graduate level counterpart of Hist 407; additional requirements. Credit not granted for both Hist 407 and 507.

508 Indians of the Northwest 3 Graduate level counterpart of Hist 408; additional requirements. Credit not granted for both Hist 408 and 508.

509 Indians of the Southwest 3 Graduate level counterpart of Hist 409; additional requirements. Credit not granted for both Hist 409 and 509.

510 Field Course in American History 3 May be repeated for credit. Readings and interpretive problems of American history.

511 American Diplomatic History 1776-1914 3 Graduate level counterpart of Hist 411; additional requirements. Credit not granted for both Hist 411 and 511.

512 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.

513 Seminar in American Studies 3 May be repeated for credit. Same as Engl 513.

515 Jefferson-Jacksonian America 3 Graduate level counterpart of Hist 415; additional requirements. Credit not granted for both Hist 415 and 515.

516 Civil War and Reconstruction 3 Graduate level counterpart of Hist 416; additional requirements. Credit not granted for both Hist 416 and 516.

517 Rise of Modern America 3 Graduate level counterpart of Hist 417; additional requirements. Credit not granted for both Hist 417 and 517.

518 United States 1914-1941 3 Graduate level counterpart of Hist 418; additional requirements. Credit not granted for both Hist 418 and 518.

519 United States 1941-Present 3 Graduate level counterpart of Hist 419; additional requirements. Credit not granted for both Hist 419 and 519.

520 American Constitutional History 3 Graduate level counterpart of Hist 420; additional requirements. Credit not granted for both Hist 420 and 520.

521 The American Frontier 3 Graduate level counterpart of Hist 421; additional requirements. Credit not granted for both Hist 421 and 521.

522 History of the Pacific Northwest 3 Graduate level counterpart of Hist 422; additional requirements. Credit not granted for both Hist 422 and 522.
523 American Intellectual and Social History 3 Graduate level counterpart of Hist 423; additional requirements. Credit not granted for both Hist 423 and 523.
525 Seminar in American History 3 May be repeated for credit. Prereq 12 hrs Hist.
526 Seminar in American Diplomatic History 3 May be repeated for credit. Research in American diplomacy and a survey of pertinent literature in the field.
527 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 May be repeated for credit; cumulative maximum 6 hours. The development of skills at the graduate level to be used in non-traditional careers for historians.
538 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 (Anth ID 531).
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 9 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 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>
</tr>
</thead>
<tbody>
<tr>
<td>Hist 100- or 200-level courses</td>
<td>12</td>
</tr>
<tr>
<td>Pol S 101 or 102</td>
<td>3</td>
</tr>
<tr>
<td>Three courses from the following: Social Sciences (Anth 101; Econ 102 or 201; Soc 101; Pol S 206 or 222; Psych 102; one from AAS 201, Bl St 101, Ch St 110, Na Am 101, or W St 200); Humanities (FA 201, 202, or 203; Hum 101, 202, 204, or 350; Phil 101, 201, 220, or 260). At least one course must be taken from each area, except that teaching majors in history must take one course from the Social Sciences, one from the Humanities, and one from the Comparative American Cultures group (AAS 201, Bl St 101, Ch St 110, Na Am 101, W St 200, or an approved substitute from that group)</td>
<td>9-10</td>
</tr>
</tbody>
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Junior Year

First Semester

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Hist 300- or 400-level</td>
<td>6</td>
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<tr>
<td>Minor Elective</td>
<td>3</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hist 500- or 400-level</td>
<td>6</td>
</tr>
<tr>
<td>Minor Elective</td>
<td>3</td>
</tr>
<tr>
<td>Literature Elective (Engl or For L)</td>
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Elective

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Minor Elective</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Hist 400-level</td>
<td>3</td>
</tr>
<tr>
<td>Minor Elective</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
</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 contem-
plate graduate work in this department should select courses similar to those required in the above schedule of studies.

## Home Economics

For instructional staff, see the following departments in the College of Agriculture and Home Economics: Child and Family Studies; Clothing, Interior Design, and Textiles; Food Science and Human Nutrition, General Agriculture and 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 Handicapped 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.

## 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 joining 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"

- Anth 198 [S] Anthropology Honors 3
Chem 298 [P] Physical Science Honors 4
(3-3) Prereq Math 107 or 198.
Econ 198 [S] Economics Honors 3
Eng 198 [W] English Composition Honors 3
Eng 199 [H] English Composition and Literature Honors 3
Hist 198 [S] History Honors 3
Hum 198 [H] Humanities Honors 3
Math 198 [Z] Mathematics Honors 3
Phil 198 [H] Philosophy Honors 3
Pol S 198 [S] Political Science Honors 3
Psych 198 [S] Psychology Honors 3
Soc 198 [S] Sociology Honors 3

U H
200 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.
300 Junior Summer Reading Examination V 1-3 May be used to fulfill the independent study requirement for the Honors Program. Examination to be taken during the first six weeks of first semester of junior year. Variable credit depending on extent and quality of summer reading.
330 Development of Western Civilization 3 Required of all Honors Program students in their junior or senior year.
350 Development of Eastern Civilization 3 Required of all Honors Program students in their junior or senior year.
400 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.
430 Foreign Study Practicum and Reports 2 By interview only. Special assignments and reports related to foreign study programs.
440 Domain of the Arts 3 Required of all Honors Program students in their junior or senior year.
450 Senior Thesis or Project V 1-4 May be repeated for credit. Thesis or project directed by student's major department.
460 Seminar 2 May be repeated for credit. Varying topics.
499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies
A bachelor's degree earned through the Honors Program ordinarily requires approximately the same number of total semester hours as required 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. In addition, 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. Students 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.

Freshman Year
First Semester
Eng 198 Honors
Math 198 or Phil 198 (or appropriate mathematics course)
Dept Requirements or Electives

Second Semester
Eng 199 Honors
Social Science Honors
Dept Requirements or Electives

Sophomore Year
First Semester
U H 200 Summer Reading Exam
U H 460 or Hum 198
Chem 298 Honors
Social Science Honors
Dept Requirements or Electives

Second Semester
U H 460 or Hum 198
Bio S 298 Honors
Social Science Honors
Dept Requirements or Electives
Department of Horticulture and Landscape Architecture

Junior Year
First Semester
U H 300 Summer Reading Exam 1-3
U H 460 or Hum 198 2-3
U H 330 Western Civilization 3
Dept Requirements or Electives 12

Second Semester
U H 460 or Hum 198 2-3
U H 350 Eastern Civilizations 3
Dept Requirements or Electives 12

Senior Year
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 12

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, D. R. Bienz, W. M. Iritani, F. E. Larsen, M. E. Patterson, B. W. Pouwaiah; Associate Professors, L. K. Hiller, W. H. Loescher, K. A. Shekel, R. L. Wample; Assistant Professors, G. S. Lee, V. I. Lohr, C. R. Rom; Extension Specialist, R. E. Thornton.

Landscape Architecture: Associate Professors, W. I. Ashland, J. R. Roberts, F. R. Steiner, K. A. Struckmeyer; Assistant Professors, B. B. Hsu, J. A. McGary.

Horticulture

Courses in horticulture are designed to give instruction in the principles and practices of fruit and vegetable production, handling, and utilization; floriculture; and nursery management. Emphasis is given to the basic principles of plant production and management and understanding the fundamentals of plant growth and development upon which cultural practices are based. The curricula are designed to prepare men and women for work in fruit and vegetable production, fruit and vegetable handling and processing, marketing and financial businesses, fieldman positions, state and federal departments of agriculture, and commercial nursery work, and related fields.

Courses in ornamental horticulture prepare students for work in greenhouses, nursery, and landscape management, florist and garden center operations, and private business.

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) Plants and gardens for food, appreciation, and pleasure; fruits, vegetables, flowers, ornamentals, and native plants.

130 House Plants 3 Basic care and use of flowering and foliage plants in the house.

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.

200 Introduction to Horticulture 2 Horticultural technology; implications and use of new techniques and tools in agriculture, cultivation; history, crops, plant classification, and aesthetics.

201 Introduction to Horticultural Science 4 (2-3) Fundamentals of plant growth and development at the cellular and whole plant levels as influenced by environment and management decisions.

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.

234 Controlled Environments for
Horticultural Production 3 (2-3) Prereq Hort 201. Principles and practices
for modifying environmental factors
for horticultural production in control
environments; methods for environmen
tal measurements. Field trip required.

251 Propagation of Plants 4 (2-6) 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 Pomology 3 (2-3) Prereq Hort 201.
The principles and practices of de
ciduous tree fruit production in Washin
gton.

313 Small Fruit Culture 3 Botanical
relationships, plant characteristics, frut
ing habits, varieties, location, culture, mar
keting, 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 cul
tural requirements; pest control, har
vesting, and marketing; greenhouse and
tropical vegetables.

321 Commercial Vegetable Crops Labora
ty 1 (0-3) Prereq c/ / in Hort 320. Prin
ciples and concepts of vegetable
plant characteristics, cultivars, produc
tion, nutrition, and culture. Field trip
required.

335 Nursery Practices and Management 3
(2-3) Prereq Hort 201, 234; Soils 201.
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 merchandising
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 horti
culture. 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 environ
ment on physiological processes.

417 Plant Pest Control 3 (2-3) Prereq Chem
240. Principles, methods, equipment,
chemicals, benefits, and hazards of
plant pest control. Field trip required.

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; physi
ological disorders; refrigeration prin
ciples. Field trip required.

419 Applications of Growth Regulators in
Agriculture 1 Prereq Bot 320. Use of
growth regulators to control germina
tion, growth, flowering, fruiting, tuber
and bulb formation, ripening, and
senescence.

420 Potato Physiology and Production Tech
nology 2 (1-3) Prereq Bot 320. Plant
and tuber physiology; physical, chemi
cal, physiological and technical con
cepts of production, storage, and pro
cessing of potatoes. Field trip required.
Credit not granted for both Hort 420
and 520. (a/y)

425 Current Topics in Horticulture 3 May
be repeated for credit; cumulative max
imum 6 hours. Prereq Hort 311, 320,
or 334; Bot 320; GenCB 301. Classical,
current scientific, and popular litera
ture on horticultural topics.

438 Greenhouse Ornamental Plant Prod
uction Practices I 2 (1-3) Prereq Hort
254. History, culture, propagation, har
vesting, and marketing of fall-grown
and potted ornamentals. Field trip
required.

439 Greenhouse Ornamental Plant Prod
uction Practices II 2 (1-3) Prereq Hort
254. Continuation of Hort 438; spring
grown crops. Field trip required.

445 Plant Breeding 3 Same as Agron 445.

456 Seminar 1 May be repeated for credit;
cumulative maximum 2 hours. Current
literature and special reports.

458 Tropical Crops 3 Prereq Bot 201. Im
portance, history, harvest, and utiliza
tion of major, field, plantation, and
horticultural crops of the tropics.

(a/y)

469 Vegetable Seed Production 1 Same as
Agron 469.
Potato Science 2 Prereq Hort 201. Origin, culture, harvesting, handling, storage, and marketing of the potato. Cooperative course taught at the University of Idaho (PISC ID 470). (a/y)

Instructional Practicum in Horticulture V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq junior or senior. By interview only.

Greenhouse Construction and Management V 1-3 Methods and materials used in greenhouse construction, environmental control, and management for greenhouse crop production. (SS)

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

Horticultural Research Techniques 1 May be repeated for credit; cumulative maximum 4 hours. Specialized techniques and methods useful in horticultural research.

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.

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.

Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.

Advanced Pomology 3 Modern concepts, research, and commercial problems as reflected in current horticultural literature. (a/y)

Physiology of Growth 1 Prereq Bot 320. Physiological changes at the cellular level, cell elongation, interaction, and effect of hormones and growth retardants in controlling growth.

Physiology of Ripening and Senescence 1 Prereq Bot 320. Physiological changes during ripening, storage, and handling of fruits and senescence of leaves, flowers, and tubers.

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)

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)

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

Students in horticulture may focus on fruits and vegetables 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 HORTICULTURE

Freshman Year

First Semester
Hort 200 Introduction to Hort 2
Bio S 103 Introductory Biology 4
Chem 101 or 105 4
Engr 101, AgHE 205, or SpCom 102 3
Hum or Soc S Elective 3

Second Semester
Hort 201 Intro Hort Science 4
Chem 102 or 106 4-5
Engr 101, AgHE 205, or SpCom 102 3
Hum or Soc S Elective 3
Electives 1-2

Sophomore Year

First Semester
Hort 234 Controlled Environments 3
Bot 120 Introductory 4
Chem 240 Elem Org Chemistry 4
Econ 201 or Ag Ec 201 3-4
Hum or Soc S Elective 3

Second Semester
Hort 311 or 320 3
Hort 251 Plant Propagation 3
Soils 201 Soils 3
Bot 320 Plant Physiology 3
Business Elective 3

Junior Year

First Semester
Hort 425 Cur Topic in Hort 3
Pl P 329 or GenCB 301 3
### Department of Horticulture and Landscape Architecture

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Soils 301 Soil Management</td>
<td>2</td>
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<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
</tr>
<tr>
<td>Hort Ornamentals Elective</td>
<td>3</td>
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<tr>
<td>Hort Elective</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 320 or 311</td>
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<td>Hort 321 Vegetable Crops Lab</td>
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<td>Hort 456 Seminar</td>
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</tr>
<tr>
<td>GenCB 301 or PI P 329</td>
<td>3</td>
</tr>
<tr>
<td>Entom 340 Ag Entomology</td>
<td>3</td>
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<tr>
<td>Ag M Elective</td>
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<tr>
<td>Computer Science</td>
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**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>
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### Senior Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 416 Hort Physiology</td>
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<tr>
<td>Hort 418 Post-Harvest Physiology</td>
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<tr>
<td>Electives and Specialties</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 417 Plant Pest Control</td>
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</tr>
<tr>
<td>Hort 456 Seminar</td>
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<tr>
<td>Electives and Specialties</td>
<td>13</td>
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</table>

Horticulture electives may include Hort 234, 313, 420, 445, 469, and 470.

### ORNAMENTAL HORTICULTURE

**Freshman Year**

**First Semester**

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>Hort 200 Intro to Horticulture</td>
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<tr>
<td>Engl 101, SpCom 102, or AgHE 205</td>
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<tr>
<td>Chem 101 or 105</td>
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<tr>
<td>Bio S 105 Introductory Biology</td>
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<td>Hum or Soc S Elective</td>
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**Second Semester**

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<tbody>
<tr>
<td>Hort 201 Intro Hort Science</td>
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<tr>
<td>SpCom 102, AgHE 205, or Engl 101</td>
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<tr>
<td>Chem 102 or 106</td>
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<td>Hum and/or Soc S Elective</td>
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**Sophomore Year**

**First Semester**

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<tr>
<td>Hort 231 Plant Materials I</td>
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<tr>
<td>Hort 234 Controlled Environments</td>
<td>3</td>
</tr>
<tr>
<td>Chem 240 Elem Org Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>Bot 120 Introduction to Botany</td>
<td>4</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 201</td>
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**Second Semester**

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<th>Course</th>
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<tr>
<td>Hort 232 Plant Materials II</td>
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<tr>
<td>Hort 251 Plant Propagation</td>
<td>4</td>
</tr>
<tr>
<td>Soils 201 Soils</td>
<td>3</td>
</tr>
<tr>
<td>Acctg 230 Prin of Acctg</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
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### Junior Year

**First Semester**

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<th>Course</th>
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<tbody>
<tr>
<td>PI P 329 General</td>
<td>3</td>
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<tr>
<td>Bot 320 Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>Soils 301 Soil Management</td>
<td>2</td>
</tr>
<tr>
<td>Hort Ornamentals Elective</td>
<td>3</td>
</tr>
<tr>
<td>GenCB 301</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort Ornamentals Elective</td>
<td>3</td>
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<tr>
<td>L A 264 Basic Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>Entom 340 Ag Entomology</td>
<td>3</td>
</tr>
<tr>
<td>B A or Ag Ec Elective</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science</td>
<td>3</td>
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**Summer Session (or semester)**

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>Hort 399 Professional Work Experience</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>Hort Ornamentals or Fruit Elective</td>
<td>2-3</td>
</tr>
<tr>
<td>Hort 416 Physiology of Crop Plants</td>
<td>3</td>
</tr>
<tr>
<td>Hort 425 Cur Topics in Hort</td>
<td>3</td>
</tr>
<tr>
<td>Hort 456 Seminar</td>
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</tr>
<tr>
<td>Hort 418 Post-Harvest Physiology</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 312 or 344</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Hort Ornamentals or Fruit Elective</td>
<td>2-3</td>
</tr>
<tr>
<td>Hort 417 Plant Pest Control</td>
<td>3</td>
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<td>Hort 456 Seminar</td>
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<tr>
<td>Hort 335 or 311</td>
<td>3</td>
</tr>
<tr>
<td>Hort 320 Vegetable Crops</td>
<td>3</td>
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<tr>
<td>Hort 321 Vegetable Crops Lab</td>
<td>1</td>
</tr>
<tr>
<td>Hort Fruit Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to the above-listed requirements, the equivalent of Math 107 must be met.

Ornamentals students must take at least 8 hours from Hort 331, 332, 335, 438, and 439 and either Hort 311 or 313.

### 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 should take 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 resources of the land so that the activities of people are in harmony with their environment. 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

202 [H] 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 construction 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, horti-

cultural, biological, aesthetic, and environmental problems. Field trip required.

363 Landscape Architecture Recreation Design V 5 (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.

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 457 and R P 567.

468 Advanced Projects in Planning and Design 3 (0-15) Prereq L A 467. Individual or group studio project in landscape architectural design or regional planning; exploring advanced techniques, methods and programming.

470 Senior Landscape and Architectural Design 3 (1-6) Design, form giving, and presentation techniques, including verbal, graphic, and written.

480 Professional Practice I 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 to make 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
Humanities GUR 3
L A 202 Built Environment 3

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 t 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 only to 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 4
Emphasis Elective*

Second Semester

L A 363 L A Design V 3
L A 366 L A Construction 4
Ag M 346 Turf Irr Sys 1
Soils 315 Intro Air Photo 1
Emphasis Electives* 6

Senior Year

First Semester

L A 467 Land Inv Analysis 5
Soils 415 Terrain Analysis 3
L A 480 Prof Practice 1
Emphasis Electives* 3
L A 470 Senior Design 3

Second Semester

L A 499 1
L A 468 Advanced Plan Design 5
L A 450 Prin Prac Planning 3
Electives 4

*Students are required to take 10 credits 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 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

Director, T. Umbreit; Professor, L. Kreck; Associate Professor, K. Kendall; Assistant Professor, W. Tomlin.

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 administration, 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 Administration.

Special Notice: Enrollment in 300- and 400-level Hotel courses is open only to juniors and seniors officially certified into degree programs that require these courses.

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; Accdg 230. Management functions relating to the planning and operational policies of various hotel departments.
310 Hospitality Industry Financial Control 3 Prereq H A 280, Accdg 231. Internal control 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 (6-6) Prereq H A major. Students work in various hospitality operations for 1,000 hours; work performance must be documented. 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, FShn 102, 120. Management theory, problems, and cases in food and beverage operations; work methods; sanitation; research.
357 Food and Beverage Systems Control 3 Prereq H A 280, Accdg 231; Cpt S 150, 153. 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, special sales efforts, intramural promotion, research.
491 Operational Analysis 3 Prereq H A 310, QMeth 215, Fin 325. Using management tools in analyzing operational effectiveness of hotel and restaurant organizations.
495 Case Studies and Research 3 Prereq H A 357, 491. 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.
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. The mathematics department runs a computing laboratory containing several micro-computers, an analogue computer and related mathematical tools. In addition, research is conducted using the department’s own VAX-11/750 mini-computer.

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 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 yr 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 Algebra 3 Prereq Math 101 or satisfactory math placement score. Functions and graphs, theory of equations, conic sections, logarithms, and exponentials.

108 Precalculus Trigonometry 2 Prereq Math 101 or satisfactory math placement score. Trigonometry, complex numbers, and discrete mathematics.


171 [Z] Calculus I 4 Prereq Math 107, 108,
or satisfactory math placement score. Differential and integral calculus of one variable with associated analytic geometry. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

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 Introduction to Finite Mathematics 3 Prereq Math 101 or satisfactory math placement score. 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 [Z] Introduction to Mathematical Analysis 3 Prereq Math 107 or satisfactory math placement score. Differential and integral calculus of the polynominal, exponential, and logarithmic functions. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

206 [Z] Mathematical Analysis for Architects 3 Prereq Math 107, 108, or satisfactory math placement score. Calculus of elementary functions; trigonometry; applications to architects. 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 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. Linear differential equations and systems; series, numerical and qualitative approaches; applications.

316 Discrete Structures 3 Same as Cpt S 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; non-linear 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.


398 Mathematical Snapshots 1 Prereq Math 172. Character, life work, and historical importance of mathematicians from various eras and branches of mathematics.

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/f. 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.

453 Graph Theory 3 Prereq Math 220. Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms.

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.

508 Topics in Applied Analysis 3 Prereq Math 502. Advanced treatment of ap-
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 3 Prereq Math 371. Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions. Joint listing with the University of Idaho (Math ID 539).

525 General Topology 3 Graduate level counterpart of Math 425; additional requirements. Credit not granted for both Math 425 and 525. Joint listing with the University of Idaho (Math ID 511).

526 Advanced Topology 3 Prereq Math 421; Math 425 or 525. General topology; basic ideas of algebraic topology. Joint listing with the University of Idaho (Math ID 512).

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) Joint listing with the University of Idaho (Math ID 553).

555 Topics in Combinatorics 3 May be repeated for credit; cumulative maximum 6 hours. Combinatorics generating functions, recurrence relations, inclusion-exclusion, coding theory; experimental design, graph theory.

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. Joint listing with the University of Idaho (Math ID 541A).

582 Seminar in Algebra 3 May be repeated for credit. Joint listing with the University of Idaho (Math ID 561).

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 Statistical Analysis of Qualitative Data 3 Prereq Math 202, 140, or 172, and a previous course in statistics. Binomial, Poisson, multinomial distribution; contingency tables; Fisher’s tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology.

430 Statistical Methods in Engineering 4 Same as Biom 450.

443 Applied Probability 3 Prereq Math 220, 273. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains. Credit not normally granted for Stat 440 and 443. Joint listing with the University of Idaho (Math ID 451).

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. Joint listing with the University of Idaho (Math ID 452).

470 Computer Methods in Probability and Statistics 3 Same as Cpt S 435.

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 Biom/Stat 512. Conceptual development of basic nonparametric tests including their power, efficiency, and ARI. Cooperative course taught at the University of Idaho (ApSt ID 514).

516 Time Series 3 Same as QMeth 516.

519 Applied Multivariate Analysis 3 Same as QMeth 519.

520 Statistical Analysis of Qualitative Data 3 Graduate level counterpart of Stat 420; additional requirements. Credit not granted for both Stat 420 and 520.

521 Multivariate Analysis 3 Prereq Math 220; Biom/Stat 512. Multivariate normal Hotelling’s T², multivariate general linear model, discriminant analysis, covariance matrix tests, canonical correlation and principal component analysis. Cooperative course taught at the University of Idaho (ApSt ID 521).

530 Applied Linear Models 3 Same as Biom 530.

531 Econometrics 3 Same as Econ 511.

532 Linear Agricultural Economics 3 Same as Ag Ec 512.

533 Linear Model Theory 3 Prereq Stat 430 or 443; Math 420. Theoretical basis of linear regression an analysis of variance models; a unified approach based upon the generalized inverse. Cooperative course taught at the University of Idaho (ApSt ID 553).

544 Applied Stochastic Processes 3 Prereq Stat 430 or 443. Poisson and Markov processes; queueing theory; auto-covariance; stationarity; power spectra; harmonic analysis; linear mean-square predictions. Joint listing with the University of Idaho (Math ID 533).

548 Statistical Theory I 3 Prereq Math 273; Stat 430 or 443. 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 430 or 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 430 or 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) Joint listing with the University of Idaho (ApSt ID 571).

572 Data Analysis 3 Prereq Math 220; Stat 430 or 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, 398, 420 and 421, plus 15 hours of Math or Stat electives numbered above 300 (Stat 443 and at least one of Math 340, 364, and 440 are recommended electives); Cpt S 150, 154 and either Cpt S 151 or 203; Phys 201, 202 and Engr 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, Accdg 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, QMeth 540, 542.

Secondary 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

Professor and Department Chair, R. W. Crain, Jr.; Professors, C. T. Crowe, J. T. Kim-

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, manufacturing, CAD/CAM, project engineering, production management, applied research and sales 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 graduate programs. 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), Master of Science in Mechanical Engineering, and Doctor of Philosophy.

**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.

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; nozzle, 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. Joint listing with the University of Idaho (ME ID 324).

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 and physical examples from mechanics of materials; manufacturing techniques, numerical control. (SS)

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 305; 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/f; 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/f; 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.

424 Flow of Compressible Fluids 2 Prereq M E 301, 303. Quasi-one-dimensional flow, shock waves, unsteady one-dimensional flow and steady two-dimensional flows. Joint listing with the University of Idaho (ME ID 412A).

435 Thermal Systems 3 Prereq M E 302; M E 404 or c/f. 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 multi-degrees of freedom; transmissibility; isolation; log decrement; energy methods; applications. Joint listing with the University of Idaho (ME ID 472).

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 Advanced Manufacturing Process 3 Mechanical and metallurgical fundamentals of machining and materials processing by conventional and non-conventional methods. Credit not granted for both M E 474 and 574.

475 Manufacturing Automation 3 (2-3) Prereq M E 210; Cpt S 203. Computer control of manufacturing processes; numerically controlled machine tools; control algorithms, component and system design. Credit not granted for both M E 475 and 575.

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. Joint listing with the University of Idaho (ME ID 524).

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. Joint listing with the University of Idaho (ME ID 522).

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)

513 Conduction Heat Transfer 2 Prereq Math 440. Analytic methods applied to multidimensional steady-state and transient conduction heat transfer, melting and ablation, numerical methods. Joint listing with the University of Idaho (ME ID 545).

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. Joint listing with the University of Idaho (ME ID 547).

515 Convective Heat Transfer V 1-3 Prereq M E 521. Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection. Joint listing with the University of Idaho (ME ID 546).

521 Fundamentals of Fluids 4 Prereq M E 303. Fundamentals of mass momentum and energy, with tensorial development of governing equations; boundary layer flows.

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. Joint listing with the University of Idaho (ME ID 520A).

525 Kinematics of Ideal Fluids 2 Prereq Math 440. Potential flow over cylinders, airfoils; vortex motion and kinematics of vortex induced flows. (a/y)


532 Finite Elements 3 Same as C E 532.

533 Experimental Methods in Materials and Manufacturing Process 3 Prereq M E 530. Theoretical and experimental techniques in engineering material behavior and manufacturing processes.

540 Advanced Dynamics of Physical Systems 3 Newtontian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications. Joint listing with the University of Idaho (ME ID 505).

541 Advanced Mechanical Vibrations V 2-3 Prereq M E 449. Response of single and multidi degree of freedom systems; finite element formulation; matrix methods, random vibrations. (a/y) Joint listing with the University of Idaho (ME ID 550).

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.

548 Acoustics 3 Prereq M E 530. Fundamental principles of linear and nonlinear acoustics and its applications. (a/y)


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, combuster modeling, laminar and turbulent flame theory, emissions. (a/y)


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 Advanced Manufacturing Process 3 Graduate level counterpart of M E 474; additional requirements. Credit not granted for both M E 474 and 574.

575 Manufacturing Automation 3 (2-3) Graduate level counterpart of M E 475; additional requirements. Credit not granted for both M E 475 and 575.

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.

Schedule of Studies

Freshman Year
First Semester
Arts and Hum Electives 3
Com Prof Elective 3
Math 171 Calculus I 4
M E 101 Graphic Design 2
Chem 105 4

Second Semester
Econ 201 Fundamentals 4
Cpr S 203 Computer Prog 2
Chem 106 Principles 3
Math 172 Calculus II 4
M E 102 Desc Geometry 2

Sophomore Year
First Semester
Math 273 Calculus III 2
Math 220 Linear Algebra 2
Phys 201 Classical Physics 4
C E 211 Statics 3
M E 210 Production Processes 4

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
M E 301, 302, 303, 404 12
M E 312, 313, 348, 414 13
M E 305, 320, 406 5
M S E 301 3
C E 314 3
E E 214, 301, 302 7
M E 416 or 417 3
M E or Technical Electives 9
Arts, Hum, Soc S Electives 6
Engl 402 or Com Prof GUR 3

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. Application deadline dates are April 15 for the fall semester and November 15 for the spring semester. Students who have not completed all of the prerequisite courses will be placed in a pre-engineering major and assigned to a mechanical 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
Program in Basic Medical Sciences

Washington to minimize problems associated with transfer. Inquiries concerning specific questions are welcome. A strong preparation in mathematics, physics, and chemistry 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.

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. Practicum, 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 5 (4-3) 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 medical sciences courses; structure,
function, differentiation and interaction.

520 Cell and Tissue Response to Injury 5
(4-3) 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
Interactive nature of biomedical, psychological, and social factors influencing illness; applying psychological principles in the medical setting.

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 5
(4-3) 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.

Description of Courses

For explanation see Index under "Symbols"

Micro

101 [B] Elementary Bacteriology and Public Health 4 (3-3) Students who receive a B grade in this course may substitute it for Micro 201 as a prereq for advanced courses. Biology of bacteria with special reference to man. Credit not granted for both Micro 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 Micro 201; Chem 240. The bacterial pathogens and their relationship to disease.

311 Diagnostic Medical Bacteriology 2
(0-6) Prereq Micro 310 or c/. Techniques and tests for the identification of bacteria pathogenic for man.

350 Clinical Laboratory Procedures 4 (2-6)
Prereq Micro 201; Org Chem. Techniques, interpretation, and theory of urinalysis, clinical chemistry, and hematology.

408 Medical Mycology 1 Prereq Micro 310.
The microbiology of fungi that cause infections in man. (a/y)

410 Advanced Medical Microbiology and Mycology 3 Prereq Micro 310. Analysis of bacterial virulence determinants; fungal infections of man. (a/y)

412 Immunology 4 (2-6) Prereq Micro 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 Micro 414 and 514.

415 General Virology Laboratory 2 (0-6) Prereq Micro 414 or c/. Laboratory techniques concerning cultivation and characterization of viruses.

416 Microbiology of Foods 3 (2-3) Prereq Micro 201; Org and Quant Chem. Microorganisms important in food; reference to spoilage processes and their control.

420 Epidemiology 3 Prereq Micro 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 Micro 201; BC/BP 364. Basic microbial physiology and its relevance to the processes of applied microbiology. Credit not granted for both Micro 428 and 528.

462 Microbial Genetics 3 Prereq Micro 201, GenCB 301, or BC/BP 364. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.

464 Techniques in Molecular Biology 3 (1-6) Prereq Micro 201, GenCB 301, or BC/BP 364-366. Introduction to basic principles and techniques of gene manipulation.

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 Immunobiology/Biology 2 (0-6) Prereq c/. in Micro 512 or intro immunology course.

514 General Virology 3 Graduate level counterpart of Micro 414; additional requirements. Credit not granted for both Micro 414 and 514.

528 Basic and Applied Microbial Physiology 3 Graduate level counterpart of Micro 428; additional requirements. Credit not granted for both Micro 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 Micro 310. Specific bacterial products and unique bacterial capabilities which enhance the virulence of individual organism. (a/y)

555 Intracellular Parasites 2 Prereq Micro 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 Micro.

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 microbiology and medical technology options. None of the core courses or departmental courses may be taken pass-fail.
Core Requirements
Bio S 103, 104; Chem 105, 106 and 107, 220 and 222, 240; Math 107 and 108; Phys 101, 102; BC/BP 364, 366.

Microbiology Option
Micro 310, 311, 412, 414, 415, 9 additional hours Micro; 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, and Math 171, 172.

Medical Technology Option
Same as Micro option except that Micro 350 and Zoal 417 are required. Micro 350 partially fulfills requirements for 9 credits of Micro electives and Zoal 417, the requirement for one advanced lecture-lab course outside the department. Micro 410 and Zoal 251 are strongly recommended.

Transfer Students
Students transferring from other institutions as juniors should have taken the equivalent of Micro 201; Chem 105, 106, 107, 220 and 222 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 microbiology 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 microbiology, biological science, molecular biology, or chemistry; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in microbiology.

Department of Military Science

W. McLoughlin; Staff Affiliates, SGM J. Cleaver, MSG R. Kluemper, SSG S. Gardner.

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. Students interested in a minor in military science should contact the department for a list of requirements.

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 in 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 two or three year scholarships.

Students who successfully complete the Ad-
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 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 Fort Knox, KY. Application required in March. (SS)

206 Military Science Overview 5 Preparation for advanced military science program; map reading, tactics, leadership, U.S. military history, fundamentals of army duty. (SS)

**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.

310 Advanced Summer Camp 6 Prereq Mil S 301, 302. By interview only. Intensive study and internship in military tactics, command and leadership; held at Fort Lewis, WA. (SS)

385 History of Modern Warfare 3 Same as Hist 385.

401 Advanced Military Leadership 3 Historical and legal basis of military justice; small unit management; military professionalism and ethics.

402 Advanced Military Management and Practicum 3 Theory and practice of Army administration/management; staff planning and correspondence; pre-commission orientation; unit management/ resources application.

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

**Department of Music of the School of Music and Fine Arts**


The Music Department is committed to a tradition of excellence in performance, teaching, 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 train teachers of music who can be effective in contemporary society;

—to assist the aspiring performer and composer to reach the highest potential of artistic capacity;

—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 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 the piano proficiency exam, as a precondition to upper-division standing.

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

200 level—Secondary and Advanced

Mus 101, 201 Organ
Mus 102, 202 Piano

103, 203 Voice
104, 204 Horn
105, 205 Trumpet
106, 206 Trombone
107, 207 Baritone
108, 208 Tuba
109, 209 Percussion
110, 210 Violin
111, 211 Viola
112, 212, Violoncello
113, 213 Contrabass
114, 214 Flute
115, 215 Oboe
116, 216 Clarinet
117, 217 Bassoon
118, 218 Saxophone
120, 220 Guitar

Major Performance Studies
Admission to 300 level is by 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 300 level denotes credit given for graduate study 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 one half-hour lesson per week and four credits for two half-hour lessons per week.

Organ Piano Voice French Horn
Mus 301 Mus 302 Mus 303 Mus 304
401 402 403 404
501 502 503 504
Trumpet Trombone Baritone Tuba
Mus 305 Mus 306 Mus 307 Mus 308
405 406 407 408
505 506 507 508
Percussion Violin Viola Violoncello
Mus 309 Mus 310 Mus 311 Mus 312
409 410 411 412
509 510 511 512
Contrabass Flute Oboe Clarinet
Mus 313 Mus 314 Mus 315 Mus 316
413 414 415 416
513 514 515 516
Bassoon Saxophone
Mus 317 Mus 318
417 418
517 518
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.

Music Performing Groups
Mus
228/428 Opera Workshop 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Fundamental of 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. Public performance may be required.
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.
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.
237 -Jazz Improvisation 1 (0-2) May be repeated for credit; cumulative maximum 3 hours. Melodic jazz improvisation.
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.
241/441 Accompanying 1 May be repeated for credit; cumulative maximum 8 hours.
243/443 Percussion Ensembles 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition.

Marching Band/Varsity Band 1 (0-3) May be repeated for credit; cumulative maximum 8 hours. Open to all university students by audition.

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.

Wind Symphony 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances.

Chamber Orchestra 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition.

Theory
Mus
152 Music Fundamentals 2 (1-3) Notation of pitch, rhythm, scales, intervals, triads, fundamental harmonic progression, coordinated with singing.
251 Materials and Structures of Music 3 By examination. Overtones, melody, rhythm, intervals, tonality, modality, penta-scales, two-voiced counterpoint, analytical techniques, composition.
252 Applied Theory 1 (0-3) By examination. 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.
255 Materials and Structures of Music 3 Prereq Mus 253, 254. Vertical, linear and formal relationships of chromatic music; writing, analysis, coordinated with aural study.
256 Applied Theory 1 (0-3) Prereq Mus 254. Continued musical development in ear training, sight singing, applied theory, keyboard dictation.
257 Materials and Structures of Music 3 Prereq Mus 351. Vertical, linear and formal relationships of 20th century music; writing, analysis, listening.
258 Applied Theory 1 (0-3) Prereq Mus 352. Continued development in ear
training, sight singing, keyboard, dictation, emphasizing 20th century music.

355 Seminar in Jazz Arranging/Composition 2 Arranging and composing for instrumental jazz ensembles.

451 Modal Counterpoint Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 353. 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 353. 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 553. 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 Music 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.


360 History of Music I: Baroque and Classic Periods 3 (2-3) Prereq Mus 161, 251, 252. 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.

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/performances 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.

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 Programs 2 For majors, minors, and Elem Educ majors only. Choral organizations, auditions, placement, into-

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 instrument 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 mechanism, 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.

575 Advanced Conducting 2 or 3 May be repeated for credit. Prereq Mus 482. Rehearsing orchestras, bands, and choirs. 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; dictation, intonation, quality, balance, blend, phrasing, style, and tone color; examination of materials.

590 Music Education V 1-3 Problems of instruction, supervision, and administration.

Problems, Research, Recitals, and Thesis

Mus

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

522 Graduate Recital 2 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 Examination 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 pass the piano proficiency exam. Students must complete the General University Requirements plus those for the College of Sciences and Arts.

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

<table>
<thead>
<tr>
<th>Theory-History Core</th>
<th>25</th>
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<tbody>
<tr>
<td>Performance Studies</td>
<td>32</td>
</tr>
<tr>
<td>Secondary Instrument</td>
<td>2</td>
</tr>
<tr>
<td>Mus 451 or 452 Counterpoint</td>
<td>2</td>
</tr>
<tr>
<td>Mus 453 Form and Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Mus 465 Sem Major Perf Lit</td>
<td>2</td>
</tr>
<tr>
<td>Mus 481 Conducting</td>
<td>1</td>
</tr>
<tr>
<td>Mus 486 Piano Pedagogy</td>
<td>1</td>
</tr>
<tr>
<td>Music Performing Groups</td>
<td>6</td>
</tr>
<tr>
<td>(to include 1 hour of Music 235/435 and 1 hour of Music 241/441)</td>
<td></td>
</tr>
<tr>
<td>Electives, 10 minimum in Music</td>
<td>16</td>
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<td><strong>Total</strong></td>
<td><strong>89</strong></td>
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All Keyboard Majors are required to accompany an approved junior or senior recital.

Option II—Brass, Woodwinds, Strings, Percussion

<table>
<thead>
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</thead>
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<td>Performance Studies</td>
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<tr>
<td>Secondary Performance Studies</td>
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<tr>
<td>Mus 455 Form and Analysis</td>
<td>2</td>
</tr>
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<td>Music Performing Groups</td>
<td>8</td>
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<tr>
<td>Electives, 8 minimum in Music</td>
<td>14</td>
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<td><strong>Total</strong></td>
<td><strong>89</strong></td>
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Option III—Voice

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<tbody>
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<td>Performance Studies (major performance area)</td>
<td>32</td>
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<tr>
<td>Mus 371, 372</td>
<td>4</td>
</tr>
<tr>
<td>Mus 453 Form and Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Mus 465 Sem Major Perf Lit</td>
<td>2</td>
</tr>
<tr>
<td>Mus 481 Conducting</td>
<td>1</td>
</tr>
<tr>
<td>Music Performance Groups</td>
<td>8</td>
</tr>
<tr>
<td>(must include 2 hours of Music 228/428)</td>
<td></td>
</tr>
<tr>
<td>Electives, 9 minimum Music</td>
<td>15</td>
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<td><strong>Total</strong></td>
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Option IV—Music Education

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<th>Theory-History Core</th>
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</thead>
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<td>Performances Studies (at least 2 hours at the 400 level)</td>
<td>14</td>
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<tr>
<td>Mus 382, 393, 394</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89</strong></td>
</tr>
</tbody>
</table>
Mus 389 Choral Program 2
Mus 480, 490 6
Mus 453 or 455 2
Mus 481, 482 Conducting 2
Music Performing Groups 6
(Vocal performers must include
Mus 228/428 for one credit hour.
Instrumentalists should include
one semester of a chamber music
ensemble.)
Professional Education courses 26
H Ed 480 or 481 2

90

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 Hours
Theory-History Core 25
Performance Studies 14
Mus 451, 452 Counterpoint 4
Mus 453 Form and Analysis 2
Mus 455 Instrumentation 2
Mus 456 Composition 12
Mus 464 Colloquium 2
Mus 481, 482 Conducting 2
Music Performing Groups 4
(to include a minimum of 1
semester of choral ensemble)
Electives, 14 minimum in Music 22

89

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 Hours
Theory-History Core 25
Mus 451 or 452 Counterpoint 2
Mus 464 Colloquium 2
Performance Studies 8
(When the student's major perform-
ance area is not keyboard, at least 2
hours of study in piano or organ is
required.)
Music Performing Groups 4

Music Electives 12
Electives 28

81

Vocal or Instrumental
Performance Option Hours
Theory-History Core 25
Performance Studies 12
(must include a minimum of 4
credits at the 400 level)
Music Performing Groups 6
Music Electives 10
Electives 28

81

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

Professor W. Willard; Assistant Professor, J.
Petersen.

The program offers a minor in Native Ameri-
can Studies which requires a minimum of 16
hours of credit, half of which must be in up-
per-division course work.

The curriculum is designed to offer inter-
disciplinary study in a wide spectrum of
courses to provide a broad knowledge of Na-

tive American cultures, so that students will be
better equipped to live and work within the
context of contemporary Native American so-
cy.

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 hu-
man resources development needs identified
by Native American communities.

Description of Courses

For explanation see Index under "Symbols"

Na Am
101 [G] Native American Studies 3 Intro-
duction 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 F A 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 [G] Native Music of North America 3 Same as Mus 265.

320 Native Peoples of North America 3 Same as Anth 320.

327 [I] Contemporary Native Peoples of the Americas 3 Same as Anth 327.

331 [I] America Before Columbus 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.

422 Native Peoples of the Pacific Northwest 3 Same as Anth 422.

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.

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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 (N S 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 commissioned officers 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 four to six weeks duration. The first and third cruises are aboard ships of the Pacific or Atlantic Fleet and often include travel to Europe or the Far East. During the second cruise, students are introduced to submarine, amphibious warfare, surface 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 of 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</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Drill Lab</td>
<td>No credit</td>
<td>Required of all Navy-Marine Corps Officer Education Program students. One hour lab per week. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>101</td>
<td>Introduction to Naval Science</td>
<td>2</td>
<td>Roles of major elements of naval service; design and structure of ships. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>102</td>
<td>Ships Systems I</td>
<td>3</td>
<td>Introduction to damage control and propulsion systems of naval ships; nuclear and conventional power. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>200</td>
<td>Seminar V 1-2</td>
<td>By interview only</td>
<td>Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>201</td>
<td>Ships Systems II</td>
<td>3</td>
<td>Naval weapons: ballistics, control, propulsion, components, systems analysis. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>202</td>
<td>Seapower and Maritime Affairs</td>
<td>2</td>
<td>U.S. Navy and merchant marine seapower, development, and policy. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>299</td>
<td>Directed Study V</td>
<td>1-2</td>
<td>By interview only. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>301</td>
<td>Navigation</td>
<td>3</td>
<td>Theory, principles, and procedures of terrestrial and celestial navigation. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>302</td>
<td>Naval Operations</td>
<td>3</td>
<td>Prereq N S 301. Naval operations and tactics, relative motion, rules of the nautical road. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>311</td>
<td>Evolution of Warfare</td>
<td>3</td>
<td>Evolution of war through tactics; strategy from Sun Tzu to J. F. C. Fuller. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>400</td>
<td>Seminar V</td>
<td>1-2</td>
<td>By interview only. Cooperative course taught by the University of Idaho.</td>
</tr>
<tr>
<td>401</td>
<td>Naval Organization and Management</td>
<td>2</td>
<td>Theories of management and management resources, motivational theories and leadership. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>402</td>
<td>Naval Leadership</td>
<td>3</td>
<td>Principles and styles of leadership, personal attributes, and UCMJ. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>412</td>
<td>Amphibious Operations</td>
<td>2</td>
<td>Amphibious doctrine from Gallipoli to Mayaguez. Cooperative course taught at the University of Idaho. (a/y)</td>
</tr>
<tr>
<td>451</td>
<td>Navy Flight Incorcoration Program</td>
<td>1</td>
<td>30 hrs introduction to naval aviation; organization and mission, navigation, principles of flight, types of aircraft, and duties of naval aviators and flight officers. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>499</td>
<td>Directed Study V</td>
<td>2-3</td>
<td>By interview only. Cooperative course taught at the University of Idaho.</td>
</tr>
</tbody>
</table>
Intercollegiate Program in Nursing


Baccalaureate Program

Washington State University is a participant in a 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 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.

Master of Nursing Program

Established in 1983, the Master of Nursing Program offers majors in Nursing Administration and Nursing Education. Advanced nursing practice content serves as core knowledge for both majors. Degree requirements, which include a thesis, can be completed in two years of full-time study. Individualized programs can be arranged to facilitate part-time study.

School Nurse Certification Program

The Eastern Washington School Nurse Certification Program is implemented through the I.C.N.E. The program unit, which consists of representatives from the I.C.N.E., Eastern Washington University, Washington State University, Whitworth College, School Nurses of Washington Association, Washington State Nurses Association, Washington Education Association, and Education School District 101, designed the school nurse program and is the policy-making body for this program.

This program was reaccredited under new guidelines by the Washington State Department of Education in November 1983. The Director of Continuing Education advises and directs the academic programs of study that lead to certification by the Superintendent of Public Instruction. Two levels of School Nurse Certification are available: (1) Educational Staff Associate—Initial Level; and (2) Educational Staff Associate—Continuing Level. Applicants for the program must have a Bachelor of Science in Nursing degree.

Description of Courses

For explanation see Index under "Symbols"

The following courses are offered at the Intercollegiate Center for Nursing Education—Spokane Campus.

Nurs

305 Scientific Concepts for Nursing 1 3 Prereq junior in Nurs. Normal developmental, physiological and psychological processes from conception through ag-

287
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.

Assertiveness Training for Nurses 2 Prereq junior in Nurs. Assertiveness training to assist professional nurses in improving interpersonal relationships in nursing situations.

Gerontologic Nursing 2 Prereq junior in Nurs. Physiologic and psychologic changes of the aging process; role of gerontologic client within society; implications for nurses.

Historical Perspectives of Nursing 2 Prereq junior in Nurs. Evolution of nursing roles, practices, and education with emphasis on nursing in the U.S.


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.

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.

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.

Advanced Concepts in the Care of the Critically Ill and Injured Patient V 3 to 5 (3-6) Prereq senior in Nurs; Nurs 406. Open to RN with basic critical care course. Nursing care of critically ill patients; new and advanced concepts.

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; emergency health care delivery.

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.

School Nursing I 6 (3-9) By interview only. Assessment of school age students (K-12); development and implementation of school health programs; roles of school nurse.

School Nursing II 4 (2-6) By interview only. Advanced health assessment, care of the school age student (K-12); consultation and school health program development and evaluation.

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

Nursing Theory and Research I 3 (2-3) Theory development in nursing, research methods in administration, education and practice.

Nursing Theory and Research II 3 (2-3) Prereq Nrs 501. Continuation of Nrs 501. Data collection and analysis; interpretation of finding and presentation of results; application to nursing practice.

Theory Development and Evaluation V 2-3 Theory development in nursing; selected theories/conceptual models; strategies for testing of derived hypotheses.

Professional Issues 2 Key issues and trends affecting health care and the nursing profession; implications for nursing education, service, research.

Strategies for Nursing Leadership 2 Strategies which form the core of nursing leadership regardless of role, position, or setting.

Nursing Service Administration: Theory and Role Analysis 4 Key issues affecting nursing administration; interpretation of nursing and management theories in nursing service settings.

Personnel Management in Nursing 2 Theories and concepts related to human behavior in the work situation; recruitment, hiring, retention; quality assurance mechanisms.

521 Process of Teaching, Learning, and Evaluation in Nursing Education 3 Critical analysis of theories related to teaching-learning process; instructional strategies; evaluation of student learning; testing and measurement.

523 Nursing Education: Theory and Role Analysis 3 Key issues affecting nursing education; application of educational theories and concepts in a variety of nursing education settings.

524 Multimedia Approaches to Instruction and Evaluation 2 Group and individualized instruction; television and other audiovisual approaches.

526 Practicum in Nursing Education 5 (0-15) Prereq NURS 508, 521, 523. Field experience in application and analysis of concepts relating to teaching-learning process; classroom and clinical settings.

561 Advanced Concepts in Transcultural Nursing 3 Advanced concepts in transcultural and ethnonursing; sociocultural and bicultural theories of health and illness.

571 Advanced Nursing Concepts I 3 Selected physiological pathophysiological environmental literature integral to advanced nursing practice; library research, discussion, application.

572 Advanced Nursing Concepts II 3 Alternative modalities in health promotion, maintenance, and restoration; family and community health theory.

574 Advanced Nursing Practice V 3 (0-9) or 4 (0-12) Prereq NURS 571, 572 or c//. Individualized laboratory experience and group seminar in episodic or distributive settings.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable 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 Sciences: 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

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101</td>
<td>3</td>
</tr>
<tr>
<td>*Psych 101</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>

Second Semester

<table>
<thead>
<tr>
<th>Course Code</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 and Man</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 102 General</td>
<td>4</td>
</tr>
<tr>
<td>Com Prof Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Zool 315 Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>*CFS 240 Dev and 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>

Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Zool 251 Human Physiol</td>
<td>4</td>
</tr>
<tr>
<td>*FSHN 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

First Semester

<table>
<thead>
<tr>
<th>Course Code</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>

*Required prerequisites for nursing major
Program in Nutrition

Second Semester
Nurs 315 Sci Con II  
4
Nurs 316 Clin Nurs II  
12
Elective  
2

Senior Year
First Semester
Nurs 405 Intro Res Nurs  
3
Nurs 406 Clinical Nurs III  
12

Second Semester
Nurs 416 Clin Nurs IV  
12
Supportive Course  
2-3
Nurs 499 Special Problems  
1-4

Transfer Students

Students who plan to transfer to nursing at Washington State University from other institutions 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, F. H. Hoskins; 
Professors, J. R. Carlson, D. C. Fletcher, J. A. Froehbi, W. W. Heinemann, B. G. Sturman, 
R. B. Wilson; Associate Professors, B. P. Chew, R. L. Kincaid, J. R. Males, L. Massey, 
T. Mehta, M. E. Mitchell, M. H. Pubols; 
Assistant Professor, G. G. Meadows; Adjunct 
Professor, C. G. King.

Associate Faculty:
Associate Professor, G. K. Jennings; Assistant 
Professors, L. J. Brady, J. Harrison, J. P. McNamara, D. Z. Price.

The interdepartmental graduate program in nutrition is composed of faculty from the Departments of Animal Sciences, and Food Science and Human Nutrition in the College of Agriculture and Home Economics; the College of Pharmacy; and, the Department of Veterinary Microbiology and Pathology in the College of Veterinary Medicine. The program offers courses of study leading to the degree of Master of Science and Doctor of Philosophy (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 in 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.

1Associate 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 chairpersons of a doctoral committee.

2Candidates 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 Seminar in Nutrition 1 May be repeat-
Program in Pharmacology and Toxicology

The sciences of pharmacology and toxicology are important to maintenance of human and animal health, food resources, and environmental quality. Pharmacologists and toxicologists study the interaction of chemicals with biological systems to understand their adverse effects and their useful effects for the treatment of disease. The Pharmacology/Toxicology Program consolidates the research and teaching expertise of faculty primarily in the Colleges of Pharmacy and Veterinary Medicine, and also in the departments or programs of chemistry, entomology, food science, mathematics, genetics, and zoology at WSU and in the veterinary science department at the University of Idaho. The Pharmacology/Toxicology Program is designed to prepare students for careers in research and teaching with both Master of Science and Doctor of Philosophy degrees offered.

Students entering the Pharmacology/Toxicology Program should have completed undergraduate work in biology, chemistry, including organic chemistry and biochemistry, mathematics through calculus and physiology. Deficiencies may be rectified during the first year of graduate study. Each student in the program is required to complete the core curriculum:

Biom 412 Biometry 3
BC/BP 563/564 General Biochemistry 6
P/T 505 Principles of Toxicology 4
P/T 506 Principles of Pharmacology 5
P/T 597 Seminar (required each year) 1

In addition, one of the two track courses is required: P/T 561 Advanced Pharmacology (3) or P/T 565 Advanced Toxicology (3). Elective coursework that complements each student's research and career interests is selected by the student in consultation with his/her adviser. Each student is required to write a thesis based upon original laboratory research. The research interests of the faculty span a broad spectrum; e.g., neurochemical and central nervous system pharmacology, mutagenesis, teratology, aquatic toxicology, xenobiotic metabolism, design of enzyme inhibitors, and chemical residues and natural toxicants in food. Proficiency in a foreign language is encouraged but not required, and declaration of a minor is optional.

Veterinary Medicine and Pharmacy faculty in the Pharmacology/Toxicology Program are housed primarily in Wegner Hall. The building was recently remodeled and provides an excellent atmosphere for study and research.
Modern instruments available for pharmacological and toxicological research include: ultraviolet, infrared, circular dichroism, fluorescence, and Fourier Transform nuclear magnetic resonance spectrometers, gas and high performance liquid chromatographs, centrifuges, ultracentrifuges, an electron microscope, and liquid scintillation counters. In addition, the building houses a health sciences library and a vivarium equipped to maintain a variety of research animals. Excellent research facilities house other members of the Pharmacology/Toxicology faculty at the University of Idaho, and at various locations on the WSU campus.

Applications for admission to the program must include GRE scores, transcripts for all college level work, three letters of recommendation, and a description of career objectives. For students whose native language is not English, TOEFL scores are also required. Applications and inquiries should be directed to: Admissions Committee Chair, Pharmacology/Toxicology Graduate Program, Pullman, WA 99164-6510.

Schedule of Studies

For explanation see Index under “Symbols”

P/T

505 Principles of Toxicology 4 Principles of modern, predictive toxicology; actions, biological disposition and environmental fate of natural products, drugs, pesticides, food chemicals and pollutants.

506 Principles of Pharmacology 5 Fundamental mechanisms of drug action and the factors that modify drug responses; fundamentals of medicinal chemistry.

507 Pharmacodynamics 5 Prereq P/T 506. Advanced concepts of the pharmacology, clinical uses, and chemistry of medicinal agents.

510 Pharmacokinetics 2 Kinetics of drug absorption, distribution, elimination, and pharmacologic response. (a/y)

511 Advanced Topics in Pharmacology/Toxicology 2 or 3 May be repeated for credit. Current research in pharmacology/toxicology.

525 Instrumental Methods in Pharmacology/Toxicology 3 (2-3) Prereq Chem 342. Procedures and instruments used in analytical and separation methods. (a/y)

526 Advanced Analysis in Pharmacology/

Toxicology 3 (2-3) Continuation of P/T 525. (a/y)

531 Principles of Medicinal Chemistry 2 Prereq Org Chem and Biochem. Theories of medicinal chemistry; quantitative structure activity relationships; metabolism of chemicals. (a/y)

532 Metabolism of Drugs and Toxins 2 Prereq P/T 531. Pathways, enzymology and mechanisms of metabolism of drugs, environmental contaminants and other xenobiotics; pharmacological and toxicological impact of metabolism. (a/y)

561 Advanced Pharmacology 3 Advanced concepts and applications of drug action. (a/y)

562 Advanced Pharmacology 3 Prereq P/T 506. Advanced concepts of general and investigative pharmacology. (a/y)

565 Advanced Toxicology 3 Prereq P/T 506. Selective toxicity to tissues and species conferred by differences in distribution, biochemistry, cytology, and bioactivation. (a/y)

597 Pharmacology and Toxicology Seminar 1 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.

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

College of Pharmacy


The objective of the College of Pharmacy is the development of students for a lifetime of responsible service in the pharmaceutical profession. The curriculum of the college is designed to prepare graduates for careers in
retail pharmacy, hospital practice, industry, nursing homes, government, and teaching.

The schedule of studies is a five-year program made up of one preprofessional year and four professional years. 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.

To supplement its lectures and conference courses, the college requires its seniors to spend one semester off-campus. During the first half of the semester, the students participate in clinical clerkships at hospitals in Spokane, Washington, where they gain experience in the delivery of health care. They spend the balance of the semester in a wide variety of health care settings in a required externship program designed to provide them with practical professional 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 College of Pharmacy offers courses of study leading to the degrees of Bachelor of Pharmacy, Master of Science in Pharmacology/Toxicology, and Doctor of Philosophy (Pharmacology/Toxicology).

**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/0 in Bact 101. The pharmacist's role in individual and group health problems.


312 Pharmaceutics II 3 Prereq Phar 311. Theory, preparation, and application of solid, semisolid, and dispersed liquid dosage forms.

313 Pharmaceutics Laboratory I 1 (0-3) Prereq Phar 311 or c/0. Laboratory in the preparation of solution dosage forms.

314 Pharmaceutics Laboratory II 1 (0-3)

**Prereq Phar 312 or c//. Laboratory in the preparation of solid, semisolid, and dispersed liquid dosage forms.**

**401 Clinical Pharmacy 5 (4-3) Prereq Phar 406. Biopharmaceutics and pharmacology applied to clinical situations, drug information and evaluation; disease states.**

**404 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.**

**405 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.**

**406 Therapeutic Agents 3 (1-6) Prereq Phar 411, 436, 472. Professional competence in applying principles of pharmacuetics, medicinal chemistry and pharmacology to selecting therapeutic products; dispensing procedures; clerkship preparation.**

**408 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.**

**411 Pharmaceutics III 4 Prereq Phar 312. Kinetics of drug absorption, distribution, and elimination; dosage regimen design; bioavailability.**

**412 Pharmaceutics Laboratory III 1 (0-3) Prereq Phar 312. Advanced techniques for the extemporaneous compounding of dosage forms; I.V. admixtures.**

**417 Non-Prescription Drugs and Health Care Accessories 2 Prereq Phar 406. Quality and use of non-prescription drug items and selected health care products.**

**419 Drug Induced Diseases 2 Prereq Phar 406. Incidence, mechanisms, manifestations, treatment and/or prevention of drug induced diseases.**

**420 Pharmacy Communication Skills 2 Application of interpersonal and written communication skills for community, hospital, and institutional pharmacists.**

**Pharmaceutical Chemistry**

**Phar**

331 Organic Medicinal Chemistry 3 Prereq
Chem 240. The organic chemistry of living systems, particularly that which applies to drug design and action.

Pharmacognosy

Phar
342 Pharmacognosy 4 Prereq Chem 342. Poisonous plants; pharmaceutically important enzymes, vitamins, antibiotics, allergens, and biologicals.

Pharmacology

Phar
464 Toxicology 2 Prereq Phar 472 or c/./. Symptomatology, prevention, treatment, and demography of toxic reactions to drugs and household, agricultural, and economic poisons.
471 Chemical Pharmacology 4 Prereq BC/BP 364; Chem 342 or Phar 331; Zool 315, 353. Mechanisms of drug action and factors modifying drug responses; physicochemical 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.

Pharmacy Administration

Phar
482 Pharmacy Law 2 Laws relating to pharmacy and professional practice.
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 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 153 semester hours. At least 80 of the total hours for this degree must be in upper-division courses.

Prepharmacy Year

First Semester
Bio S 103 Introductory
Chem 105 Principles
Math 140 Math-Life Sci
Hum or Soc S Elective

Second Semester
Bio S 104 Introductory
Chem 106 Principles
Chem 107 Qualitative Analysis
Com Proficiency
Hum or Soc S Elective

First Professional Year

First Semester
Phar 101 Orientation
Chem 240 Organic1
Bact 101 Elementary
Com Proficiency
Elective2

Second Semester
Phar 310 Social Health
BC/BP 364 Biochemistry
Econ 201 Principles3
Phar 300 Phar Calculations
Phar 331 Org Med Chem1
Elective3

Second Professional Year

First Semester
Phar 311 Pharmaceutics I
Phar 313 Pharmaceutics Lab I
Phar 341 Beg Pharmacognosy
Zool 315 Gross/Micro Anat
Phar 467 Human Path

294
Second Semester  
- Phar 312 Pharmaceutics II  
- Phar 314 Pharmaceutics Lab II  
- Phar 342 Pharmacognosy  
- Phar 471 Chem Pharmacology  
- Zool 353 Zoophysiology  

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Third Professional Year  
First Semester  
- Phar 406 Therap Agents  
- Phar 411 Pharmaceutics III  
- Phar 436 Chemotherapy  
- Phar 472 Pharmacodynamics  
- Phar 473 Pharm/Biopharm Lab  

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</table>

Second Semester  
- Phar 401 Clinical Pharmacy  
- Phar 412 Pharmaceutics Lab III  
- Phar 464 Toxicology  
- Phar 482 Pharmacy Law  
- Phar 484 Pharm Administration  
- Phar 417 Drugs Accessories  

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<th>Hours</th>
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<tbody>
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Fourth Professional Year  
First Semester  
- Electives (professional and non-professional)  

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<tr>
<th>Hours</th>
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Second Semester  
- Phar 408 Clinical Clerkship  
- Phar 405 Prof Practice  

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</table>

1 Students may substitute Chem 340, 341, 342, 343 for the Chem 240/Phar 331 sequence.
2 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.
3 Econ 203 acceptable if Econ 201 cannot be scheduled.

Department of Philosophy

Associate Professor and Department Head, M. R. Neville; Professors, D. H. Bishop, J. E. Broyles, J. C. Carloye, H. S. Silverstein; Associate Professor, G. W. Lilge; Assistant Professor, J. A. Montmarquet.

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 degree of Bachelor of Arts in Philosophy.

Description of Courses

For explanation see Index under "Symbols"

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>Phil 101</td>
<td>[H] Introduction to Philosophy 3 Nature and place of philosophy in human thought; problems and achievements.</td>
</tr>
<tr>
<td>Phil 102</td>
<td>[C] Writing and Reasoning 3 Better writing through the development of critical thinking skills.</td>
</tr>
<tr>
<td>Phil 107</td>
<td>[H] Philosophy of Religion 3 Western religious thought, nature and knowledge of God, relations to science, morality, and society.</td>
</tr>
<tr>
<td>Phil 198</td>
<td>[H] Philosophy Honors 3 The nature of formal arguments; principles of scientific inquiry.</td>
</tr>
<tr>
<td>Phil 201</td>
<td>[H] Elementary Logic 3 Analysis and evaluation of deductive and non-deductive argument.</td>
</tr>
<tr>
<td>Phil 220</td>
<td>[H] Aesthetics 3 Philosophy of art; analysis of aesthetic experience; criteria of art criticism. (a/y)</td>
</tr>
<tr>
<td>Phil 260</td>
<td>Ethics and Contemporary Social Issues 3 Ethics through analysis of contemporary moral and social issues.</td>
</tr>
<tr>
<td>Phil 300</td>
<td>[H] History of Ancient and Medieval Philosophy 3 Pre-Socrates, Plato, Aristotle; post-Aristotelian philosophy to the Renaissance. (a/y) Joint listing with the University of Idaho (Phil ID 309).</td>
</tr>
<tr>
<td>Phil 305</td>
<td>[H] History of Modern Philosophy 3 Renaissance; 17th and 18th century philosophers. (a/y) Joint listing with the University of Idaho (Phil ID 310).</td>
</tr>
<tr>
<td>Phil 310</td>
<td>[H] Recent and Contemporary Philosophy 3 19th and 20th century philosophers. (a/y)</td>
</tr>
<tr>
<td>Phil 314</td>
<td>[I] Philosophies and Religions of India 3 Prereq Phil 101 or 107. Metaphysical, epistemological, ethical, aesthetic, social, and political views of Hinduism, Buddhism, and Islam, and their influence on Indian civilization.</td>
</tr>
<tr>
<td>Phil 315</td>
<td>[I] Philosophies and Religions of China and Japan 3 Prereq Phil 101 or 107. The philosophies and religions of China and Japan, and their metaphysical, epistemological, ethical, social, and political positions and views of God and Gods.</td>
</tr>
</tbody>
</table>
Department of Physical Education, Sport, and Leisure Studies

325 20th Century Philosophy 3 Prereq 3 hrs Phil. Selected major philosophers and movements in philosophy since the turn of the century. (a/y)
335 Seminar in Theory of Knowledge 3 Prereq 3 hrs Phil. Problems of immediate knowledge and mediated knowledge, modes of cognition. (a/v)
340 Seminar on Metaphysics 3 Prereq 3 hrs Phil. Theories of self, world, God, nature of being. (a/y)
360 Business Ethics 3 The principles of ethics as applied to specific problems in business faced by individuals and corporate institutions.
365 Bioethics 3 Prereq 3 hrs Bio S. Ethical problems in medicine and biological research.
370 The Rights and Welfare of Animals 3 The ethical foundations of proper care and use of animals (pets, wildlife) in food production and research.
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. (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 Seminar in Philosophical Psychology 3 Prereq 3 hrs Phil. Theories of mind, self, mental acts, psychological states and human actions. (a/y)
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.
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.

Department of Physical Education, Sport, and Leisure Studies


The Department of Physical Education, Sport and Leisure Studies unites 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, athletic training, aquatics, dance, physical education for exceptional children, and health education.
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) 3-8 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 251 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
   PEP 261, 313, 362, 382, H Ed 363; plus 4 courses from PEP 100-200-level activity courses; PEACT 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 Department of Physical Education.

2. Coaching: 21 hours
   Spe 102; PEP 220, 266, 330 or 465, 488, 489, plus 6 hrs 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 department.

3. Health Education: 18-20 hours
   H Ed 361, 383, 480 or 481; Psych 102; one course from each of the following groups: FSHN 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 hours minimum
   PEP 116, 117; 316 or 317; or 257, 261, 362; plus 5 hrs from PEACT 122, 124, 121, 120, 124, 127, 220, 222, 224, 226, 227, 316, 317, 327, 354, 356, 490, 499. Must be approved by the department.

2. Aquatics: 20-30 hours

3. Athletic Training: 43 hours
   Psych 102, FSHN 130, Zool 251, PEP 261, 266, 362, 463, 465, 466, 499, H Ed 361, 363. Recommended electives: Chem 101, Phys 101, Psych 101, Phar 217, PEP 300, Zool 315, PEP 494. The option must be approved by the department; students are admitted by screening procedure.

4. Elementary Physical Education (for students majoring in Elementary Education)
   30 hour minimum

5. Exercise Science Option: 30 hours
   PEP 113, FSHN 130, Mgt 301, H Ed 361, RLS 241, Psych 363, PEP 390, RLS 489.

6. Adapted Physical Education: 14 hours
   PEP 379 or 380; 3 hrs from PEP 473, 474, 475, 499; 3 hrs of PEP 490; 6 hrs from Sp Ed 401, 402, 403.

Schedule of Studies

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 physical education and sports-related areas. Students majoring in elementary education may also take physical education as their area of subject-matter concentration.

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

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

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<th>Hours</th>
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<td>PEP 104 Art Sci Move</td>
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<td>PEP 199 Disciplines of P E</td>
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<td>PEP 261 Anatomy</td>
<td>3</td>
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<tr>
<td>PEP 313 Motor Skills</td>
<td>3</td>
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<tr>
<td>PEP 362 Kinesiology</td>
<td>3</td>
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<tr>
<td>PEP 382 Secondary Sch Prog</td>
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</table>
PEP 463 PE Handicap 2-3
PEP 465 Physiol of Exer 3
PEP 482 Principles of P E 3
PEP 494 Tests and Measurements 3
PEP 496 Seminar 1
Zool 251 Intro Hum Physiol 4

B. 5-8 hours from PEP 113, 114/115, 116/117, 121/120, 124, 125/126, 127/118/119; 3 hours from approved activities.

C. 4 hours from minimum of two areas:
PEP 314, 316/317, 320, 324, 393.

RECREATION AND LEISURE STUDIES

D. Albright, M. Blazey, D. Strong.

The Recreation and Leisure Studies curriculum is designed to provide professional preparation in the areas of private commercial recreation, park administration, program supervision, and therapeutic recreation. The major in RLS must complete a core program of general education and professional recreation and leisure studies requirements in addition to completing option requirements in an area of specialization. Theory and practice are combined in preparing the student for future employment in the leisure service industry. A total of 1000 hours of documented practical experience is required of all majors prior to their enrollment in the field work experience.

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.

A major in the Recreation and Leisure Studies 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.

General Education Requirements: These classes have been selected to enhance the student's general preparation and to fulfill general university requirements in communication and social sciences. SpCom 102; Psych 101 or 102; Soc 101 or 102. Sciences and humanities GUR's should be selected with an adviser's assistance and in consideration of the student's option area.

Recreation Core Requirements: 46 hours

Commercial Option: 46 hours
6 hrs from Mgt 301, 340, 401; 6 hrs from Acctg 230, Mktg 360, Mktg 367, Econ 102, Econ 201; 3 hrs from B Law 210, Ins 320, R E 305, SpCom 331; 4 hrs Cpt S; 5-6 hrs from FSHN 170, 270, 220, H A 181, 235, 280, 310, 311, 356, 381, 496; 3 hrs from Psych 306, 350, 360, 361; 3 hrs from Soc 270, 320, 342, 356, 371, 373; 9 hrs from PEP or RLS.

Park Option: 46 hours
6 hrs from Ag M 201, 203, 210, 211, 312, 313, 321, 331, 344, Agron 301, Mgt 301, C E 101 or L A 264; 4 hrs Cpt S; 6 hrs from Crm J 101, 150, 210, 320; 6 hrs from Hort 101, 201, 231, 251, FRM 412; 9 hrs from PEP or RLS. Science GUR's recommended: Env S 101, FRM 303, Math 107.

Program Option: 46 hours

Therapeutic Option: 46 hours

SPORT MANAGEMENT MAJOR

The Sport Management major, leading to the Bachelor of Arts degree in Recreation and Leisure Studies, will provide professional preparation for those students wishing to pursue a management career in sport organizations or sport business. Students must complete a core program of sport management and recreation and leisure studies requirements. An area of specialization is planned by the student and adviser on an individual basis. General University Requirements should be selected upon recommendation of an adviser and should include: Com 101, Psych 101, Soc 101, SpCom 102, and FSHN 130.

Sport Management Requirements—54-58 hours.

PEP 113 2
PEP Skills 4
RLS 276 2
### Core Requirements — 11 hours
- RLS 321 3
- RLS 341 3
- RLS 383 2
- RLS 488 1
- H Ed 363 2

### Area of Specialization — 18 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 173 are for beginners. Courses numbered 177 through 266 are for intermediate or advanced students.

Activity course credit is granted on the basis of one credit for two one-hour classes per week. PEACT COURSES MAY NOT BE REPEATED FOR CREDIT.

### PEACT
- **001** Sport Conditioning. No credit. Out-of-season conditioning for varsity sport participants and other interested students.
- **101** Beg Cond
- **102** Beg Cond—ROTC
- **106** Self Defense
- **107** Beg Judo
- **108** Karate
- **109** Beg Boxing
- **111** Beg Wrestling
- **112** Wt Training
- **114** Beg Tumbling
- **115** Beg Gym App
- **116** Beg Gym App—Women
- **117** Group Tumbling
- **118** Adapted PE
- **119** Aerobic Dance
- **120** Am Soc Dance—Men
- **121** Am Soc Dance—Women
- **122** Beg Ballet
- **123** Int Folk Dance—Men
- **124** West Sq Dance—Men
- **125** West Sq Dance—Women
- **126** Beg Mod Dance
- **127** Beg Jazz—Lifesaving
- **128** Beg Swimming
- **129** Beg Swimming—Women
- **130** Diving
- **131** Scuba Diving
- **132** Cond Swim
- **134** Cond Skiing
- **135** Water Polo
- **140** Jogging
- **141** Beg Golf
- **143** Beg Bowling
- **145** Beg Fencing—Men
- **146** Beg Fencing—Women
- **148** Beg Badminton
- **150** Beg Tennis
- **177** Int Racquetball

#### Professional Courses
- **PEP**
- **104** Art and Science of Movement
- **113** Fitness 2 (1-3) Introduction to principles and skills in physical fitness.
- **114** Tumbling 1 (0-3) Skills and techniques in teaching floor exercises.
- **115** Gymnastics Apparatus 1 (0-3) Skills and techniques in pommel horse, rings, vaulting, parallel bars, horizontal bars and spotting.
- **116** Introduction to Recreational Dance 2 (1-3) Same as RLS 116.
- **117** Modern/Ballet/Jazz 2 (1-3) Introduc-
tion 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.
124 Field Sports 1 (0-3) Techniques, individual and team tactics, and officiating.
125 Volleyball 1 (0-3) Techniques, individual and team tactics, and officiating.
126 Basketball 1 (0-3) Techniques, individual and team tactics, and officiating.
127 Softball 1 (0-3) Techniques, individual and team tactics, and officiating.
199 Discipline of Human Movement 2 For freshmen and sophomores. Scientific and philosophical foundations of human movement professions.

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 Men's 210 Women's
Gymnastics 211 Wrestling

220 Officiating V 1-2 May be repeated for credit; cumulative maximum 4 hours.
257 Theory of Dance 2 Historical background; philosophy. (a/y)
261 Anatomy 3 (2-3) Human skeletal structure and articulations; skeletal musculature; the nervous, respiratory, and circulatory system.

266 Care and Prevention of Athletic Injuries 2 (1-3) Administration of school sports health care programs; prevention, treatment, and rehabilitation of sports injuries.
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
303 Football 309 Volleyball 304 Men's Gymnastics
310 Women's Gymnastics 315 Soccer 311 Wrestling
307 Tennis 312 Swimming
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 315. 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 Methods V 1 (0-3) or 2 (0-6) Prereq PEP 177 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 Not open to PE majors. Anatomy, physiology, physiology of exer-
cise, and kinesiology; practical applications to coaching situations.

340 Chicano Dance and Theater 2 Same as Ch St 340.

354 Creative and International 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 for performance and production.


379 Physical Education for Primary Grades, K-2 2 (1-3) For elementary education majors. Materials and methods of primary physical education instructors.

380 Physical Education for Intermediate Grades 3-6 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//. 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 3 (0-9) 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 V 1 (0-3) to 6 (0-18) 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 PACT 235. Red Cross water safety certificates awarded to those who qualify.

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. (SS)

433 Aquatic Programs 2 Prereq PEP 303 or WSI certification. Organization and administration of aquatic facilities, management, and maintenance.

460 Therapeutic Recreation for Afflicted and Handicapped Populations 3 Same as RLS 460.

463 Principles of Movement for Individuals with Disabilities 2 (1-3)* or 3 (2-3) Knowledge, understanding, and skills for teaching movement activities to individuals with disabilities; practicum required.

465 Physiology of Exercise 3 (2-3) Prereq PEP 261; Zool 251. Physiologic adjustments of the body during exercise, training, and stress.

466 Advanced Athletic Training 1 May be repeated for credit; cumulative maximum 4 hours. Advanced theory and techniques of athletic training.

473 Developing Individual Education Programs 1 Developing programs for the handicapped and normal population based on needs and abilities. (SS)

474 Assessment of the Exceptional Child 1 Tests and measures to determine the motor level and skill capabilities of handicapped children. (SS)

475 Activities and Programs for Exceptional Children 1 Practical adaptation of games and activities for exceptional children in the regular physical education class. (SS)

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 Behavioral Aspects of Sport 3 Psychological concepts and implications for performance in sport.

490 Instructional Practicum V 1-4 May be

*2 credits for students in special education only.
repeated for credit; cumulative maximum 6 hours.

494 Evaluation in Physical Education 3 (2-3) Tests, their administration and use, use of computers, interpretation and use of statistics; formation of sound grading systems.

496 Special Topics I May be repeated for credit; cumulative maximum 4 hours. Physical education, leisure, recreation, dance, health, sports.

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

501 Trends and Issues in Physical Education, Recreation, and Athletics 3 May be repeated for credit; cumulative maximum 6 hours.

502 Motivation 1 Theories of motivation and their practical application to sport and physical activity. (SS)

503 Sport Events Management I Policies and procedures necessary for competent management of sport events. (SS)

504 Application of Recent Research on Teaching in Physical Education 1 Current research reviewed and critiqued; potential ramifications to teaching physical education. (SS)

506 Use of Media in Research and Instruction 1

507 Innovative Programs I Strategies for developing innovative curricula. (SS)

509 Curriculum Development and Learning I Identification and application of factors influencing curriculum decision making. (SS)

510 Financial Management of Sport Programs I Budgeting, computerizing, funding, developing systems of accounting and marketing. (SS)

511 Health and Medical Aspects of Sport I or 2 Medical supervision, first aid, nutrition, conditioning policies, relationships with health service, legal implications, effects of competitions and care of injuries. (SS)

512 Facilities and Equipment in Sport Programs I or 2 Current concepts in school sports facilities, modifying present facilities, educational specifications for facilities, evaluation of athletic facilities. Credit not granted for both PEP 487/587 and 512. (SS)

513 The Law and Sport I or 2 Personal and institutional liability, transportation of athletes, insurance coverage, legal responsibilities associated with Title IX, sports injuries; case studies. (SS)

514 Public Relations for Sport Programs I or 2 Working with the media, audio-visual and oral and written techniques for good public relations. (SS)

515 Assessment of Sport Programs and Personnel I or 2 (SS)

516 Athletic Programs Administration I or 2 Athletic event management, tournament, officiating; interrelations of men's and women's programs; Title IX implications, business and accounting procedures. (SS)

517 Applying Scientific Principles to Improving Performance I or 2 Scientific knowledge relating to improving athletic performance; analysis of coaching methods and individual techniques; field of exercise physiology, biomechanics and coaching theory. (SS)

518 Sociological Aspects of Sport I or 2 The sociological significance of sport. Credit not granted for both PEP 518 and 578. (SS)

564 Mechanical Analysis of Motor Activity 3 Prereq PEP 562. Fundamental laws of mechanics applied to motor activities.

565 Advanced Physiology of Exercise I or 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. Biological and mechanical aspects of human movement.

573 Historical and Philosophical Perspectives in Physical Education and Sport I or 2 History and philosophy of physical education and sport with implications for future objectives, methodology, and course content.

575 Physical Education and Sport Programs in Higher Education 3 Prereq PEP 482. Professional, required, intramural, 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 Current research findings in psychol-
ogy pertinent to the teaching and coaching of physical activities.

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 Curriculum and Instruction in Physical Education 3 Principles of curriculum construction and the process of instruction as the vehicle to implement curricular decisions.

586 Administrative Perspectives in Physical Education and Sport 2 or 3 Administrative theory as applied to the setting and democratic process, to the administrator, and to the process of administration.

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 Research Techniques 2 (1-3) or 3 (2-3) Application and use of research techniques and tools 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 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 3 Application of the scientific approach to research in physical education, sport, and leisure.

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/f. Methods, materials, and resources.


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 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.

276 Introduction to Sport Management 2 Nature of sport management; scope of sport related business; related literature.

285 Recreation Leadership 2 (1-3) Prereq RLS 275. Theories and techniques of leadership.

290 Intramural Administration 2 (1-3) Same as PEP 290.

310 Outdoor Education 3 (2-3) History, philosophy, and programs in outdoor education; environmental awareness; developing strategies in outdoor education. (SS)

316 Recreation Dance for the Teacher V 1 (0-3) to 2 (0-6) Prereq RLS 116 or competency; PEP 315. Methods and materials for social, folk, and square dancing.


327 Dance Movement Therapy 2 (1-3) Same as PEP 327. (a/y)
Commercial Recreation 3 Prereq RLS 285. Organization and function of commercial and industrial recreation; commercial goods and services offered in leisure market.

Wildland Recreation 3 Same as FRM 371.

Interpretive Techniques 3 (2-3) Same as FRM 373.

Recreation Programming 3 (2-3) Prereq PEP 285; certified major in PE or RLS. Current principles and practices in recreation programming.

Physical Education for Intermediate Grades 2 (1-3) Same as PEP 380.

Therapeutic Recreation Service 2 Prereq RLS 285. The rationale for therapeutic recreation delivery systems and services and their relationships to the treatment setting.


Supervised 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 community recreation and park programs.

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.

Wildland Recreation Management 3 (2-3) Same as FRM 471.

Planning and Marketing of Leisure 3 Prereq RLS 375, 388. Process of financing, managing, and marketing of leisure services.

Recreation and Park Administration 3 Prereq RLS 375, 475. Principles underlying the organization, supervision, and administration of delivery systems.

Seminar in Therapeutic Recreation 1 Prereq RLS 275, 285, 375, 383. Major trends and issues in therapeutic recreation; leisure counseling, needs of specific populations, new techniques.

Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Same as PEP 487.

Current Trends in Parks and Recreation 1 Prereq RLS 275, 375, 475. Current trends and issues in parks and recreation; participation, resources, and development.

Fieldwork/Internship V 8-12 Prereq RLS 389, 481, 488, 490; 1000 hours practical experience. By interview only. Supervised practicum in an established agency or business.

Instructional Practicum V 1-4 Same as PEP 490.

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

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, astro-
physics, 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 needed 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); 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), 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 part-time 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.

102  General Physics 4 (3-3) Prerequisite: Phys 101. Fundamental principles and applications of optics, electricity, magnetism, and atomic and nuclear physics; oriented toward non-physical science majors.


202  Classical Physics for Scientists and Engineers 4 (3-3) Prerequisite: Phys 201; Math 172. Concepts in electricity, magnetism, and light, using calculus. Designed for engineering, physical science, and pre-medicine majors.

303  Modern Physics 3 Prerequisite: Math 172; Phys 202. The quantum and relativity theories with applications from atomic, nuclear and solid state physics.

304  Modern Physics 3 Prerequisite: Phys 303. Continuation of Phys 305.

310  Modern Laboratory Techniques 3 (1-6) Prerequisite: Phys 202, 303 or c/f. Fundamental laboratory techniques of current interest, and classical experiments.

320  Mechanics 3 Prerequisite: Math 315 or c/f; Phys 102 or 202. Particle motion in one, two, and three dimensions; motions of systems of particles; rigid body motion; Lagrange's equations.

322  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 Prerequisite: Math 273 or c/f. 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 Prerequisite: Math 315 or c/f. 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 345.

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) Prerequisite: Phys 102 or 202. Laboratory construction and investigation of electronic circuits employed in research instruments.
Astronomy and Astrophysics 3 May be repeated for credit; cumulative maximum 6 hours. Same as Astr 435.

Optics 3 Prereq Phys 341 or c/. Geometric optics; diffraction, interference, and polarization phenomena of the electromagnetic spectrum; crystal optics. (a/y)

Quantum Mechanics 3 Prereq Math 315. Introduction to quantum theory with applications to atomic physics. Credit not granted for both Phys 450 and 550.

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.

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.


Seminar in Physics Literature 1

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

Classical Mechanics I 3 Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.


Thermodynamics 3 Prereq Phys 330; Math 440. Physical theories of equilibrium thermostatics and irreversible thermodynamics with applications in thermomagnetics, superfluids, and superconductivity.


Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Same as Astr 538.

Electromagnetic Theory 3 Prereq Phys 571, 572 or c/. Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

Electrodynamics 3 Prereq Phys 541, 552 or c/. Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

Quantum Mechanics 3 Graduate level counterpart of Phys 450; additional requirements. Credit not granted for both Phys 450 and 550.

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.

Quantum Theory II 3 Prereq Phys 551. Symmetry and invariance, angular momentum; formal theory of scattering; relativistic wave mechanics; second quantization.

Atomic and Molecular Physics 3 Graduate level counterpart of Phys 461; additional requirements. Credit not granted for both Phys 461 and 561.

Physics of the Solid State 3 Graduate level counterpart of Phys 463; additional requirements. Credit not granted for both Phys 463 and 563.

Atomic and Molecular Phenomena 3 Same as Ch P 564. (a/y)

Introductory Nuclear Physics 3 Graduate level counterpart of Phys 465; additional requirements. Credit not granted for both Phys 465 and 565.

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.

Methods of Theoretical Physics 3 Prereq Phys 571. Continuation of Phys 571

Advanced Solid State Physics 3 Prereq Phys 534, 542, 552, 571. Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.


Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours.
Topics of current interests in advanced physics. Joint listing with the University of Idaho (Phys ID 581).

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 maximum 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, 373, 410, 440, 441, or 448; Chem 103, 106, and 107 (or Chem 115, 116, and 117); Engl 201; Cpt S 150 and 151 or 154.

Optional physics courses include Phys 435, 443, 450 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 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 worldwide basis.

The undergraduate program in plant path-
ology 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. Students who expect to become professional plant pathologists are advised to include in their 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 and Home Economics section of this bulletin.

**Description of Courses**

*For explanation see Index under “Symbols”*

**PI P**

329 General Plant Pathology 3 (2-3) 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. Not open to graduate majors in PI P. (a/y)

421 General Mycology 4 (2-6) Prereq Bot 201. The structure, life histories, classification, and economic importance of the fungi. (a/y)

440 Economic Nematology 3 (0-9) Prereq PI S 305. Techniques of isolation, identification crop loss assessment and control of plant parasitic nematodes. Cooperative course taught at the University of Idaho (PI S 1D 440).

472 Biology of Fungi 2 Prereq Bio S 203. Life activity of fungi; structure, life history, and classification. (a/y) Cooperative course taught at the University of Idaho (Bot ID 421/521).

473 Fungi in the Laboratory 1 (0-3) Prereq PI P 472 or c/ff. Culture, experimentation, isolation, and morphology of fungi. Cooperative course taught at the University of Idaho (Bot ID 422/522).

475 Post-Harvest Pathology 3 (2-3) Prereq PI S 305. Pathologic conditions responsible for post-harvest loss of food crops, visual aids and fresh specimens. Cooperative course taught at the University of Idaho (PL Sc 1D 475).

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. (SS)

513 Nematodes and Nematode Diseases of Plants 2 (1-3) Prereq PI P 329. Anatomy, identity, and diseases caused by nematodes; techniques and control. (SS)
Phytochemistry 4 (3-3) Prereq BC/BP 564; Bact 201. Isolation and characterization of bacteria having a saprophytic, symbiotic, or pathogenic association with plants—molecular structure, function, and genetics.

Seminar I May be repeated for credit.

Basidiomycetes 3 (2-3) Prereq Pl P 421. Taxonomy, physiology, and reproduction of rusts, jelly fungi, smuts, and higher basidiomycetes. (A/y)

Ascomycetes and Fungi Imperfecti 2 (1-3) Prereq Pl P 421. Taxonomy, phylogeny, physiology, reproduction of ascomycetes, and fungi imperfecti. (A/y)

Lower Fungi 2 (1-3) Prereq Pl P 421. Taxonomy, phylogeny, physiology, and reproduction of aquatic and terrestrial phycomycetes and myxomycetes. (A/y)

Physiology and Genetics of Parasitism 5 Prereq BC/BP 564; GenCB 501. Genetic and physiologic aspects of host-parasite interactions. (A/y)

Seed Pathology 3 (2-3) Prereq Pl P 329. Seed-borne pathogens including fungi, bacteria, and viruses, nature of their infection, and relation to spread of plant diseases. (A/y) Cooperative course taught at the University of Idaho (PlSc ID 540).

Advanced Forest Pathology V 2-4 Prereq Pl 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 (For ID 563).

Advanced Forest Pathology V 2-4 Prereq Pl 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 (For ID 564).

Special Projects or Independent Study Variable credit.

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

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 should consult their advisors 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 3
Biom 301 Agric Stat 4
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 Precalculus 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 105/106 for Chem 105/106; Ag Ec 201 for Econ 201; AgHE 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 botany, plant physiology, bacteriology, general plant pathology, entomology, precalculus, organic chemistry, and report writing or advanced composition.

Plant Physiology

Graduate study leading to degrees of Master of Science in Plant Physiology and Doctor of Philosophy is offered as an interdepartmental curriculum by the graduate faculty from the Departments of Agronomy and Soils, Botany, Horticulture and Landscape Architecture, Plant Pathology, the Program in Biochemistry and Biophysics, and the Institute of Biological Chemistry. The objectives of the program are to provide the graduate student with a broad knowledge of plant physiology and with research experience in a chosen area within this discipline. Specialization includes cellular and subcellular physiology, the molecular biology and biochemistry of plant-related processes, photosynthesis and photorespiration, nitrogen fixation, phytochemistry, the physiology of vascular plants, stress metabolism, plant pathogen interactions, hormonal interactions and regulation of growth, crop production physiology, and physiological ecology as well as related areas in agriculture and biology.

Students entering the program must have completed their baccalaureate degree with training in elementary biology or botany, physics (one year of each), chemistry through one semester of organic chemistry, one semester each of plant physiology and genetics, and mathematics (through calculus). Limited undergraduate deficiencies may be remedied by taking the appropriate courses upon enrollment in the graduate program on a provisional basis. Degree requirements for both the M.S. and Ph.D. degrees include courses in advanced plant physiology, plant morphology and anatomy, and biochemistry. Additional requirements for the Ph.D. include physical chemistry (or a related course), experimental techniques, and plant biochemistry. To meet the minimum requirements of core course credit in the Graduate School, elective courses are chosen as approved by the student's advisor and the supervising committee of Graduate Faculty. There is no foreign language requirement.

Policies and procedures of the Graduate School apply to all admissions. Interested students may direct their inquiries directly to Plant Physiology or to any participating academic unit. Should the latter route be followed, preference for the program in Plant Physiology must be indicated and, if possible, the research area of interest identified.

The program offers flexibility for students with varied backgrounds in chemistry, biochemistry, plant physiology, molecular biology, botany, biology, and the agricultural sciences to pursue advanced training in plant physiology, with independent study and original research in areas of the student's own interests as the single most important component. The interdisciplinary nature of the program assures the student of interaction with plant physiologists and plant scientists representing a wide range of research interests and provides the student with a broad choice of specialized facilities which are available in the cooperating academic units.

Financial support for students in the program is determined within the administering academic unit and not by Plant Physiology. Participating faculty may provide support through individual grants and contracts. Every effort will be made to inform applicants of these opportunities.

Course requirements are drawn from existing courses offered by cooperating departments and programs. In addition, a non-credit seminar is held weekly during each semester.

Department of Political Science

Professor and Department Chair, T. Tsurtan; Professors, J. D. Dowell, N. P. Lovrich, P. M. Morgan, W. H. Peterson, J. C. Pierce, C. H. Sheldon; Associate Professors, T. E. Cook, P. R. Hagner, W. F. Mallen; Assistant Professors, D. R. Calverton, L. W. Sayers.

Criminal Justice, Director and Associate Professor, B. Menke; Assistant Professors, T. C. Castellano, M. G. Mathews.

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, the Division of Governmental Studies and Services (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  
206 State and Local Government 3 Institutions, processes, and problems, with special reference to the state of Washington. Fulfills Washington teaching certification requirements.  
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 writing of Marx and Engels to contemporary developments.  
434 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.  
539 Teaching Political Science 1 Methods, problems, and purposes of teaching introductory political science courses in college with practice teaching and video replay.
Seminar in Political Theory 3 May be repeated for credit; cumulative maximum 6 hours.

Comparative Government

Pol S

310 Democratic Government 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 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 436 and 536.

462 Human Issues in International Development 3 Same as Anth 462. (a/y)

471 Contemporary South Asia 3 Same as Hist 471.

472 Western European Democracies 3 Political institutions and policy-making processes in European democracies such as Great Britain, France, and the German Federal Republic. Credit not granted for both Pol S 472 and 572.

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.

472; additional requirements. Credit not granted for both Pol S 472 and 572.

587 Seminar in Political Violence 3 Meaning, measuring, patterns, causes, theories, consequences of political violence. Cooperative course taught at the University of Idaho (PolSc ID 587).

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.


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
degree 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 degree counterpart of Pol S
426; additional requirements. Credit
not granted for both Pol S 426 and 526.

527 United States Foreign Relations 3 Gradu-
ate degree 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 degree counterpart
of Pol S 429; additional requirements.
Credit not granted for both Pol S 429
and 529.

561 Seminar in U.S. National Security Pol-
icy 3 U.S. defense and arms control
policies; current strategies and weapons
issues.

575 Seminar in Theoretical Approaches to
International Relations 3 Group dy-
namics, 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 max-
imum 6 hours. Prereq one course in in-
ternational relations, international law,
organization, or American foreign rela-
tions. Methodology, decision-making
institutions and processes.

Public Policy Formation

Pol S

305 Gender and Politics 3 Role of gender
in political behavior; voting and po-
lar participation; 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 Political Parties and Pressure Group 3
Theories of parties; characteristics of
American parties; organization and be-
havior of pressure groups.

324 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 Anal-
ysis of public policy formation, evalua-
tion and implementation.

417 The Electorate 3 Measurement and in-
terpretation of electoral behavior; fac-
tors influencing the electorate; voter
competence; representation of the elec-
torate. Credit not granted for both Pol
S 417 and 517.

450 The Legislative Process 3 Role of leg-
islatures in a democratic system; prob-
lems of representation; election and
tenure of lawmakers; legislative orga-
nization and procedures. (a/y)

455 The Presidency 3 Organization and pro-
cesses of executive institutions at the
national level; uses and limits of execu-
tive power. Credit not granted for both
Pol S 455 and 555.

517 The Electorate 3 Graduate degree coun-
terpart of Pol S 417; additional require-
ments. Credit not granted for both Pol
S 417 and 517.

555 The Presidency 3 Graduate degree coun-
terpart of Pol S 455; additional require-
ments. Credit not granted for both Pol
S 455 and 555.

556 Governmental Policy and Program
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 (PolSci ID
556).

591 Seminar in Public Policy Formation 3
May be repeated for credit; cumulative
maximum 6 hours.

Public Administration

Pol S

422 Public Administration and Program
Management in Developing Countries
3 Same as Ag Ec 422. (SS)

440 Introduction to Public Administration
3 Basic theories of administrative or-
ganization, relationships, and behavior.
Credit not granted for both Pol S 440
and 540.

443 Administrative Regulation 3 Govern-
ment controls over the economy focusing
upon the administrative regulatory pro-
cesses, their environment, and tech-
niques. Credit not granted for both Pol
S 443 and 543.

445 Public Personnel Administration 3 De-
velopment 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 (PolS ID 501).

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 543.

545 Public Personnel Administration 3 Graduate level counterpart of Pol S 445; additional requirements. Credit not granted for both Pol S 445 and 545.

546 Public Budgeting 3 Graduate level counterpart of Pol S 446; additional requirements. Credit not granted for both Pol S 446 and 546.

552 Seminar in Administrative Theory 3 Major writers in political theory and concepts; leadership, supervision, authority, decision-making and human relations. Cooperative course taught at the University of Idaho (PolS ID 552).

555 The Presidency 3 Same as Pol S 455 above.

557 Seminar in Budgeting 3 Federal, state, city, and county budgeting systems. Cooperative course taught at the University of Idaho (PolS ID 557).

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 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 3 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 federal, 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.

Study Abroad

401 Topics in Political Science 3 Study Abroad (London)

403 Topics in Political Science 3 Study Abroad (London)

405 Topics in Political Science 3 Study Abroad (Avignon)

407 Topics in Political Science 3 Study Abroad (Avignon)

409 Topics in Political Science 3 Study Abroad (Cologne)

411 Topics in Political Science 3 Study Abroad (Cologne)

415 Topics in Political Science 3 Study Abroad (Guadalajara)

419 Topics in Political Science 3 Study Abroad (Guadalajara)
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.

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Pol S 101 or 198, 102; 201 or 222</td>
<td>4-6</td>
</tr>
<tr>
<td>Econ 201 or 102 and 203</td>
<td>3</td>
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<tr>
<td>Hist Elective*</td>
<td>3</td>
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<tr>
<td>Anth 101 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 or 102 Intro Psych</td>
<td>3</td>
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<tr>
<td>Phil 201 Elem Logic</td>
<td>3</td>
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Junior Year

First Semester

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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Pol S Elective</td>
<td>6</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
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</table>

Second Semester

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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Pol S Elective</td>
<td>6</td>
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<tr>
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Senior Year

First Semester

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Second Semester

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<tr>
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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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Pol S 101 or 198 and 6 hrs from 102, 206, and 222</td>
<td>9</td>
</tr>
<tr>
<td>Hist Elective*</td>
<td>6</td>
</tr>
<tr>
<td>Anth 101 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201 or 102 and 203</td>
<td>4-6</td>
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<tr>
<td>Psych 101 or 102 Intro Psych</td>
<td>3</td>
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<tr>
<td>Phil 201 Elem Logic</td>
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Junior Year

First Semester

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<tr>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>Pol S 300 Amer Const</td>
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<tr>
<td>Engl 201 or 301</td>
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<tr>
<td>Acctg 230 Prin Acctg</td>
<td>4</td>
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<tr>
<td>Elective</td>
<td>5</td>
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Second Semester

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<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Pol S Elective</td>
<td>6</td>
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<tr>
<td>Econ, Hist, Psych, or Soc Elective</td>
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<tr>
<td>Elective</td>
<td>6</td>
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Senior Year

First Semester

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<td>Pol S Elective</td>
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<tr>
<td>Econ, Hist, Psych, or Soc Elective</td>
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Second Semester

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<th>Course</th>
<th>Hours</th>
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<tr>
<td>Pol S Elective</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>12</td>
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Option III. Public Administration

This program is designed to provide a broad foundation in political science and related subjects which can be built either a public serv-

*One course in American history plus one additional course from Hist 101, 102, 110 or 111.
ice 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 plann-
ing, 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 Accntg 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.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Pol S 101 or 198, and 206</td>
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<tr>
<td>Psych 101 or 102 Intro Psych</td>
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**Junior Year**

**First Semester**

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<th>Hours</th>
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<tbody>
<tr>
<td>Pol S 300, 440</td>
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<tr>
<td>Accntg 230 Prin Acctg</td>
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<td>Elective</td>
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**Second Semester**

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<th>Hours</th>
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<tbody>
<tr>
<td>Pol S Elective</td>
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<tr>
<td>QMeth 215, Soc 321, Math 361, or Psych 311</td>
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<td>Elective</td>
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**Senior Year**

**First Semester**

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<td>Econ 340 Pub Fin Tax</td>
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**Second Semester**

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<tr>
<td>Pol S Elective</td>
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**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 the adviser. In the past, students in this option have done work in the following substantive policy areas: urban natural resources, energy, welfare, and environmental. Sample curricula are available from the Option V adviser in the department.

**Department requirements are:**

a. 24 hours in political science, including 101, 206, 416, 440

b. Econ 102/203 or 201

c. Engl 201 or 301

d. Soc 321 or Psych 311

e. a minimum of 15 hours in the substantive
policy are chosen with the approval of the department Option V adviser.

Junior Year

First Semester
Pol S 440 Intro Pub Admin 3
QMeth 215, Soc 321, Math 360 or Psych 311 3
Engl 201 or 301 3
Policy Area Elective 3
Elective 3

Second Semester
Pol S 416 Intro Policy Analy 3
Pol S Elective 3
Policy Area Elective 6
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. Melvor, 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.

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. Melvor, 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 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 or a single composite letter written by the coordinator must strongly support the applicant. 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 advisor usually is able to suggest a schedule of studies to meet the needs of the individual students. Medical schools also expect a good selection of non-science courses on the student’s transcript.

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 the learning/cognition or biological/sensory areas of experimental psychology.

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, perception, animal behavior, physiological psychology, 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 prereq to later courses.

230  Human Sexuality 3 Prereq Psych 101
or 102. Sexuality in personal development; personal, cultural, biological influences on sexual identification and behavior; fertility, reproduction, sexual functioning, 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; application of behavioral principles to student-conducted projects.

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.

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.


440 (340) Clinical/Community Psychology 3 Prereq Psych 321, 333. Professional problems; theory, training, relations with clients, institutions, public.

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 1 (0-3) to 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 CPRS 240. Intellectual and emotional disorders of children.
Department of Psychology

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.

473 Advanced Physiological Psychology 3 Prereq Psych 372. Neurophysiological, hormonal, and biochemical bases of regulatory behavior; theoretical and applied issues. (a/y)

477 Primate Behavior 3 Prereq Psych 285 or a Zoo lab course. Laboratory and field investigations on behavior of non-human primate; learning, memory, motivation, family structure, habitat and behavior development. (a/y)


490 Psychology of Learning 3 Prereq 8 hrs Psych; Psych 311. Techniques, findings, and theories of learning and retention.

494 Advanced Laboratory in Psychology 1 or 2 Prereq Psych 285, 311. Experimental research in psychology.

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 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 16 hours. Research design, equipment, data collection, data analysis, and report writing.

504 History of Psychology: Theoretical and Scientific Foundations 3 Roots of scientific explanation in psychology are traced through various philosophical schools and psychological movements.

505 Teaching Introductory Psychology 1 May be repeated for credit; cumulative maximum 4 hours. Problems and techniques related to teaching of introductory psychology.

506 Seminar in Current Problems 2 May be repeated for credit.

507 Topics in Psychology 3 May be repeated for credit.

508 Special Topics in Psychology V 1-3 May be repeated for credit.

511 Advanced Statistics in Psychology 3 Prereq Psych 311. Probability, statistical inference, correlation and regression, multivariate applications; computer analyses.

512 Statistical Inference and Research Design 3 Prereq Psych 511. Psychology statistics used in the design and analysis of experiments.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 511, 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.

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.

522 Applied Behavioral Research 3 Research theory and methodology on development of applied programs.

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.

544 Medical Psychology 3 Psychology in physical health and illness.

545 Clinical Methods 3 (0-9) May be repeated for credit. Prereq Psych 520, 530, 535, 536, 539 or c-/f. 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-/f. By interview only. Advanced practice in the clinical application of psychology; supervised practical training.

547 Seminar in Clinical Psychology 3 May be repeated for credit. Advanced current topics in clinical psychology.

550 Advanced Social Psychology 3 Theories, findings, and methods in group processes, interpersonal attraction, and personal perception.

551 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.

561 Developmental Psychology 3 Theories of development and research methods; emotional, cognitive, moral and adult development; language and sex roles; research in current social problems.

574 Physiological Psychology 3 May be repeated for credit. Neuroanatomical, neurochemical, and other biological cases 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.

578 Behavioral Endocrinology 3 Prereq Psych 574. Roles of the neuroendocrine system in normal and abnormal behavior.

579 Behavior Neuroscience 3 Prereq Psych 574. Advanced topics in neurochemistry, neurophysiology, and neuroanatomy.

584 Sensory Bases of Behavior 3 Prereq Psych 480. Sensory and physiological aspects of vision audition, and other senses.

585 Psychology of Visual Perception 3 Perception of size, distance, form, contrast, illusions; motivation, personality, information processing.

586 Seminar in Physiological/Sensory Psychology 3 May be repeated for credit. Advanced current topics in physiological/sensory psychology.

591 Models of Learning 3 Historical and current theory and research in learning and cognition.

592 Cognition and Memory 3 Experimental approaches to human information processing, memory, and cognition.

593 Experimental Analysis of Behavior 3 Operant conditioning in relation to the experimental evidence currently available; examination of research strategies.

594 Seminar in Learning/Cognition 3 May be repeated for credit. Advanced current topics in learning/cognition.

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.

* to be completed during the freshman and sophomore years.

Recommended Courses
Psych 494 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 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.

Social Science Courses

Soc S
305 Leadership Development in Agriculture and Home Economics 3 Same as AgHE 205.
405 Public Policy in Agriculture and Home Economics 3 Same as AgHE 405.
443 Current Issues in Agriculture and Home Economics 3 Same as AgHE 443.
444 Rural Development in International Agriculture and Home Economics 3 Same as AgHE 444.

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 Human society and social behavior; effects of groups, organizations, cultures, and institutions. Prereq for all courses except Soc 102, 150, 199, 381.


150 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 Personal Identity and Social Interaction 3 Development of self-concept in social interaction; attitudes, values, beliefs and behaviors; conformity and interpersonal 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 I 4 Prereq Soc 320. Levels of measurement; measures of central tendency, dispersion and association; probability, normal curve, statistical inference.

330 Communities 3 Organization, function, change, development, and decline of communities; applications emphasizing rural or urban settings.

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 Social Inequality: Privilege and Poverty in America 3 Distribution of income, wealth, and opportunities; causes and consequences of inequality; social classes.

341 Sociology of Religion 3 Effects of religion on everyday life and the major institutions of society; cults and sects.

342 Political Sociology 3 Sociological analysis of political institutions and power structures; social and cultural basis of political behavior.

343 Sociology of Occupations and Occupations 3 Relationship between work and social class, alienation, sexism, racism, poverty, disease and death.


351 The Family 3 Prereq Soc 101 or Psych 101. Family system and its interaction patterns; family life cycle from marriage through death; marital relations, divorce, sexuality, parenting crisis, abuse.

355 [S] Human Values 3 Prereq Soc 101 or Psych 101. Defining and measuring societal and individual values; value conflicts of Americans; moral development and change; impacts on behavior.

356 Sociology of Aging 3 Changes in behavior and social roles due to aging; economics and demographics of aging; social relations of the elderly; retirement and widowhood.

360 Theories of Deviance 3 Theoretical perspectives on deviant behavior; crime, juvenile delinquency, mental illness, suicide, alcohol and drug abuse, sexual deviance; social control.

361 Criminology 3 Crime and society; nature, types, and extent of crime; theories of criminality: control of crime.

362 Juvenile Delinquency 3 Sociological perspectives on delinquency; delinquent gans and subcultures: delinquency causation and control; law and its enforcement: juvenile justice and corrections.

364 Law and Society 3 Prereq Crm J 101 or Soc 101. Social factors in the emergence and operation of law; impact of law on society.

365 Problems of Alcohol Addiction and Abuse 3 Same as Psych 365.
Problems of Alcohol Addiction and Abuse 3 Same as Psych 366.

371 Small Group Analysis 3 Prereq 6 hrs Soc. Interpersonal relations in small groups; influence and social power; stereotypes.

373 Mass Communication and Public Opinion 3 Social history of print and broadcast media; communication and mass media; public opinion, propaganda, censorship, violence, conflict and change.

374 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.

381 Sociology of Black Americans 3 Sociological examination of the Black experience in America.

383 Sociology of the Chicano 3 Sociological overview of the Chicano; demographic socio-economic, social/psychological characteristics relative to life styles of migrant and settled Chicanos.

384 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, problem, definition, sampling measurement, research design.

421 Quantitative Techniques in Sociology II 3 Prereq Soc 320, 321. Probability theory, inference theory, one and two sample tests; simple and multiple regression analysis.


431 Environmental and Society 3 Environmental problems, policies and contro-

432 Energy and Society 3 Energy and societal evolution; energy consumption patterns 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 Social factors in health and illness; organization and change in health care; impacts of rising costs and aging.

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 parents and child socialization and self-concept formation.

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.


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.

517 Seminar in Contemporary Sociological Theory 3 Recent developments in sociological theory, analysis, application and appraisal of specific theoretical systems.

520 Research Methods in Sociology 3 Prereq
521 Special Topics in Quantitative Techniques III 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 430. 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.

533 Social Impact Assessment 3 Sociology's contribution to environmental impact assessments; methods, contents, and contexts of assessing social impacts of proposed developments.

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.

544 Sociology of Religion 3 Role of religion in social structure, process and change; analysis of religious behavior.

545 Sociology of Community 3 Prereq 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 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.
Behavioral Sociology 3 Sociological research and theory dealing with overt behavior of humans in social situations.

Race and Ethnic Relations 3 The nature of intergroup relations; processes and consequences of race and ethnic group contact. (a/y)

Seminar in Sociology 3 May be repeated for credit; cumulative maximum 9 hours.

The Sociology Profession 1 May be repeated for credit; cumulative maximum 2 hours. Requirements, operations, problems, and possibilities of the sociology profession.

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.

Social Welfare and Public Policy

S W 190 Introduction of Social Work 3 Survey of practice; social workers and social service agencies, individual group, and community 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.

393 Community Organization I: Political Process 3 Social legislation creation and impact on delivery services by professional/paraprofessional social workers.

394 Community Organization II: Creative Process 3 Prereq S W 393. Methods for creating new facilities to deal with social problems; organizing community effort.

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 social agency; knowledge in the helping relationship; decision making in applied settings.

Social Work Theory and Methods I 3 Prereq S W 190. Social work values, ethics; technical aspects of interviewing and working with client systems; communications skills.


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

Schedule of Studies

Students who wish to obtain the bachelor's degree are required to earn 30 hours of credit in sociology not including Soc 366. They are required to earn 30 hours of credit in related fields, half of which must be in upper-division courses.

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. The student may choose one of the following three options, depending upon personal interest.

Option I. General Sociology

The following curriculum is intended for students who have selected sociology as the major field around which to build a liberal arts education, or who wish to become professional sociologists through building a foundation at the undergraduate level for graduate training in sociology.

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

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<tr>
<th>Course Code</th>
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<td>Soc 101 Introduction</td>
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<td>Soc 320 Intro to Social Res</td>
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<td>Soc 321 Quant Tech I</td>
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<td>Soc 410 Dev of Social Th</td>
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<th>Course Code</th>
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<tr>
<td>Soc 102 Social Problems</td>
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<td>Soc 270 Social Interaction</td>
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<td>Hist 101, 102 or 110, 111</td>
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<td>Pol S 101 American Govt</td>
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<td>Econ 201 Principles</td>
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<td>Anth 101 Introduction</td>
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<td>Psych 101 Intro Psych</td>
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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: Math 201, 202; Phil 201, 425; Cpt 151, 370.

**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 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 effectively 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.

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<td>Soc 101 Introduction</td>
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<td>Soc 320 Intro Soc Research</td>
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<td>S W 190 Intro Social Work</td>
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<td>S W 390 Soc Welfare and Society</td>
<td>3</td>
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<td>S W 393 Community Organization I</td>
<td>3</td>
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<td>S W 493 Theory and Methods I</td>
<td>3</td>
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<tr>
<td>S W 494 Theory and Methods II</td>
<td>3</td>
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<td>S W 490 Field Placement</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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<td>Soc 101 Introduction</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 Envr and Society</td>
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<td>Soc 424 Soc and Public Policy</td>
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<td>S W 390 Soc Welfare and Society</td>
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<td>Pol S 440 Public Administration</td>
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<td>S W 490 Field Placement</td>
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<td>Soc 373 Mass Com Public Op</td>
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Soils

J. P. Reganold, 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 degrees of Bachelor of Science in Soils, Master of Science in Soils, and Doctor of Philosophy.

Description of Courses

For explanation see Index under “Symbols”

Soils

201 Soils 3 Prereq Chem 102. Chemical, physical, and biological properties of soils.

301 Soil and Water Conservation and Management 3 Prereq Soils 201. Soil and water conservation; soil erosion; fertilizers, amendments and soil reclamation; soils in environmental quality control.

371 (315) Fundamentals of Remote Sensing 1 Physical basis of remote sensing, characteristics of aerial photographs, reflectance from earth surface features.

372 (316) Forstery Application of Airphoto Interpretation 2 (1-3) Fundamentals of remote sensing, aerial photography, photogrammetry applied to forest management.

413 (411) Physics of Soil-Water-Plant Relations 3 (2-3) Prereq Math 107; Soils 201. Water retention and transport in soil; water, structure, aeration, and temperature in relation to plant growth.

414 (417) Introduction to Environmental Biophysics 2 Prereq Phys 102; Math 107. Physical principles of biological environments, radiative energy transfer, turbulent transfer of momentum, heat, and water vapor in the lower atmosphere.

415 (418) Environmental Biophysics Laboratory 1 (0-3) Prereq Soils 414 or c/1. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments.

421 (400) Soil Chemistry 3 Prereq Soils 201. Water quality, salt and pesticide migration, chemistry of soil use and modification, acid and alkaline soils, fertilizer reactions, agricultural pollution.

422 (401) Soil Analysis 2 (1-3) Prereq Soils 421 or 441 or c/1. Chemical characterization of soils for diagnostic purposes.

431 (407) Soil Microbial Ecology 3 Prereq Bact 101 or 201; Chem 240; Soils 201. Basic aspects and significance of soil flora as related to soil ecology, plant growth, and environmental problems.

436 (460) Microbial Physiology 3 (3-6) Prereq Bact 201. Concepts of microbial physiology; growth, metabolism, regulation, variation, structural-functional relationships. (a/y) Cooperative course taught at the University of Idaho (Bact ID 460).

441 (402) Soil Fertility 3 Prereq Soils 301. Plant nutrient requirements, principles of soil testing and tissue analyses, current fertilizer technology, fertilizer reactions in soils.


452 (406) Soil Inventory 3 (2-3) Prereq Soils 451. Design of mapping units and descriptive legends, inventory techniques and field practices, soil interpretation.

472 Remote Sensing of Environment 3 Basic remote sensing applied to inventory of natural resources; use of remote sensing methods in research. Cooperative course taught at the University of Idaho (For ID 472).

474 (415) Remote Sensing Applied to Terrain Evaluation 3 (2-3) Prereq physical geology; Soils 315. Remote sensing and
photointerpretation methods applied to terrain—landforms, soils, land use.

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

501 (512) Seminar 1 May be repeated for credit. Presentation of research information.

502 (514) Advanced Topics in Soils 1 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 421, 422, 413. Interpretation, presentation, and discussion of current research on soils, uses, and management.

503 (501) 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. Joint listing with the University of Idaho (Soils ID 510).

513 (511) Advanced Soil Physics 2 Prereq Soils 413. Physics of the soil-water system. (a/y)

522 (500) Advanced Soil Chemistry 3 Prereq Soils 421; Chem 220 and 222. Chemical properties of soil colloidal system. (a/y) Joint listing with the University of Idaho (Soils ID 512).

524 (505) Soil Mineralogy 3 Prereq Chem 220 and 222. Structures, properties, and identification of major clay minerals; solution equilibria and clay mineral weathering. (a/y)

527 (506) Soil Organic Matter 2 Prereq Soils 421, 431. Formation, chemical properties, and significance of soil organic fraction. (a/y) Cooperative course taught at the University of Idaho (Soils ID 511).

529 (509) Chemistry of Plant Nutrients 3 Prereq Soils 421; Chem 220 and 222. Chemistry of plant nutrients in soils, including uptake and utilization by plants. (a/y) Cooperative course taught at the University of Idaho (Soils ID 515).

531 (507) Advanced Soil Biochemistry and Microbiology 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 421, 431; BC/BP 364. Biochemical and microbiological processes in soil-water environments; nutrient cycling; pesticide behavior; agricultural waste disposal; nitrogen fixation; advanced techniques.

541 (502) Advanced Soil Fertility 3 Prereq Soils 421, 422, 441. Methods of evaluating nutrient availability and soil fertility. (a/y)

547 (503) Fertilizer Science 1 or 3 Prereq Soils 441. Manufacture, use, placement, and factors influencing choice of fertilizers. Week-long field trip and individual lab project required. (a/y) Cooperative course taught at the University of Idaho (Soils ID 547).

551 (550) Advanced Soil Genesis 3 Prereq Soils 451. Formation, properties, and significance of soils of the Pacific Northwest. Week-long field trip and individual lab project required. (a/y)

557 (504) Advanced Soil Genesis and Classification 3 (2-3) Prereq Soils 451. Genesis, classification and interpretation of soils, including field investigation emphasizing existing interrelationships. (a/y) Cooperative course taught at the University of Idaho (Soils ID 551).

572 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. (a/y) Cooperative course taught at the University of Idaho (Soils ID 572).

573 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 measurement multistage sampling. (a/y) Cooperative course taught at the University of Idaho (Soils ID 573).

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

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, 413, 421, 422, 451; Chem 105, 106, and 220 and Chem 222; Geol 102; Bio S 103; Bot 201 or Bio S 104; Bot 320; Bact 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 442; 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 basic skills of field identification of soils and soil properties. They should complete, in addition to the core requirements, Soils 452, 474; 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. Wadleigh, M. E. Wingate; Associate Professors, G. R. Caldwell, G. D. Chermak, L. J. Harris, C. L. Madison, R. G. Slabaugh; Assistant Professors, L. J. Furman, K. B. Kennedy, B. B. Sewell; Instructors, M. Chase, J. E. Dengerink, 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, mode 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 practice 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 prepared, as Communication Disorders Specialists (Speech/Language Pathologists) and Audiologists, to provide direct and consultative services in education and/or medical settings. The course of study emphasizes the physiological and psychological processes of normal development, the fundamental communication process, and the disorders of communication. The analytic and independent application of course content to the clinical process is encouraged.

The Communication Disorders program is accredited nationally by the Education and Standards Board of the American Speech-Language-Hearing Association and, on the state level, by the Office of the Superintendent of Public Instruction.

State and national certification requires an M.A. or its equivalent. Bachelor's level training in Communication Disorders is considered preprofessional.

The Communication Disorders Clinic is the on-campus training facility for the Communication Disorders program. University student may receive free speech/language/audiologist services through the Communication Disorder Clinic.

The Theatre Arts and Drama area offers a variety of courses and practical experiences to supply the student with the skills, critical judg...
ment, 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 program leading to the degree of Doctor of Philosophy (American Studies).

**Description of Courses**

*For explanation see Index under "Symbols"

**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.

205 Introduction to Communication Disorders 3 (2-3) Defects of articulation, language, rhythm, and voice as they relate to public school and general populations.

281 Manual Communication for the Deaf 2

Instruction and practical training in sign language for communication with the deaf.

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.

372 Hearing and Hearing Disorders 2

Acoustic and psychophysiological aspects of normal hearing, and the nature and consequences of hearing disorders.

375 Phonetics 2

Acoustic and applied phonetics.

376 Clinical Methods in Articulation 3

Prereq Spe 205; 375. Evaluation and management of articulation disorders of speech; delayed phonological acquisition, dysarthria, and dyspraxia.

377 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.

378 Speech Science 2

Prereq Spe 205, 375. Scientific processes involved in and accompanying the speech act.

469 Sign Language II 3

Prereq Spe 281. Sign language systems; vocabulary and skill development in signing and interpreting signs.

471 Introduction to Clinical Practice 2

Prereq Spe 376. Therapy methods and procedures in speech/language pathology audiology; state/federal laws affecting public school therapy.

472 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.

473 Language and Learning Disability 3

Diagnosis and remediation of language and learning disabilities in individuals manifesting disorders in understanding or using spoken/written language.

474 Stuttering 3


475 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.

477 Audiological Rehabilitation 3

Theories and methods involved in the audiological rehabilitation of the hearing impaired; use and care of hearing aids; counseling techniques.

478 Therapy for Language Delay and Disorders 3

Prereq Spe 371. Assessment and habilitation for the preschool and elementary-age child with language disorders.

480 Diagnosis and Appraisal of Speech Language Disorders 3

Prereq Spe 375, 471, 473. Principles, techniques, and materials involved in exploring the nature of speech and language disorders; planning programs of therapy.

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 1

May be repeated for credit; cumulative maximum 4 hours. Instruction and guidance in teaching the basic course in Speech.

570 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.

571 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.

572 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.

573 Cleft Palate 3 Prereq Spe 205, 377. Speech and voice problems associated with clefts of the lip and palate.

574 Aphasia 3 Prereq Spe 205, 377, 478. Speech and language disabilities associated with brain injury.

575 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 hearing disorders.


578 Seminar in Audiology 3 May be repeated for credit; cumulative maximum 9 hours. Explanation of ideas derived from current writings and research in selected aspects of audiology.

579 Seminar in Clinical Supervision 3 (2-3) Identification and practice in techniques of clinical supervision; supervisory conference behavior. (SS)

580 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. (a/y)

582 Developmental Psycholinguistics 3 Prereq Spe 205, 371. The nature of children's language and theories of language and speech development.

584 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.


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/f)

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.

Theatre Arts and Drama

Drama

160 [H] Introduction to Theatre 3 Drama as prepared and presented for the cinema, for television, and for the stage.

163 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 (2-3) Fundamental techniques of acting with emphasis on the actor's approach to characterization and play production.

263 Stage Costuming 3 (2-3) Basic costume construction techniques, sewing skills, measurement, patterns, fabrics, draping for the stage.

264 Stage Makeup 2 (0-6) Basic techniques in the design and execution of makeup for the stage and television.

294 Stage Speech 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Techniques and exercises for development of the actor's voice for the stage: voice production, articulation, and application.

306 Drama in Recreation 3 Prereq major in RLS. Drama techniques applied to a recreation setting; organizing and lead-
ing drama activities for all ages; creative drama, story telling, and theatre.

360 Acting II 3 (2-3) Prereq Drama 260. By interview only. Intensive work in text analysis and in the development of the techniques of sustained character portrayal.

361 Fundamentals of Play Directing 3 (2-3) Prereq Drama 260. For juniors and seniors. Theories of directing; principles of composition, blocking, casting, organization, and rehearsal; scene rehearsals and presentation.

362 Structure of Drama 3 Aristotelian analysis of four plays, a musical, and a film; action, 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 Drama 306. 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, plays, playwrights, actors, architecture, scenery, and costumes.

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 Theatre Practicum V 1-3 May be repeated for credit; cumulative maximum 10 hours. Supervised backstage production work; scenery, costumes, lights, box office and publicity.

418 Topics in Speech 3 Study Abroad (London)

450 Advanced Techniques of Acting 3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Prereq Drama 360. Preparation for performance and individual character study for the advanced student of acting.

460 Play Production with Non-Professionals 3 Acting, directing, design, stage management, and front-of-the-house organization for producers of amateur theatre. Suitable for high school teachers. (a/y)

461 Play Directing II 3 (2-3) Prereq Drama 361, 362. Continuation of Drama 361. Credit not granted for both Drama 461 and 561.

463 Seminar in Theatre Design 3 (0-6) 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. (a/y)

464 Topics in Design and Technical Production for Theatre 2 (0-4) May be repeated for credit; cumulative maximum 12 hours. Advanced projects in scenery and properties; costuming, lighting and sound; solving design and technical problems for productions.

465 Historic Costume for the Stage 3 History of western world costume with emphasis on contemporary stage adaptation.

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 and scripts.

468 Theatre for Children and Youth 3 Theories, dramatic literature and production demands of theatre for children and youth.

490 Internship in Professional Theatre V 10-15 Prereq Drama 163 or 263, 396, 260, 264, 360 or 361, 362, 365 or 366. Off-campus experience with Seattle area professional theatres in all aspects of production excluding performance.

493 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.

498 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. (SS)

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

541 History of the Theatre 3 Major devel-
opments 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 Play Directing II 3 (2-3) Graduate level counterpart of Drama 461; additional requirements. Credit not granted for both Drama 461 and 561.

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. (a/y)

568 Seminar in Theatre 3 May be repeated for credit; cumulative maximum 6 hours. Research in a specific area of theatre.

590 Graduate Internship in Professional Theatre V 12-15 Prereq Spe 501 and completion of one academic year of master's level coursework in the theatre arts and drama program at WSU. Internship position at upper level of administration or production that requires expertise in specific areas; theories/practical application.

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 Communication Disorders program provides preparation for professional (graduate) training as a speech/language pathologist or audiologist. In addition to the courses listed below, an undergraduate public school internship (Spe 476—Office of Continuing Education and Public Service) is required.
(b) For program options, see Department of Education.

2. Theatre Arts and Drama:
   (a) 13 hours of Performance: Drama 250, 260, 264, 360, 361, and 468.
   (b) 18 hours of Dramaturgy: Drama 362, 365, 366, 467, and 6 hours of approved literature electives.
   (c) 15 hours of Design/Tech: Drama 163, 263, 363, 465, and 460 or 468.
   (d) 6 hours of Practicum: 4 hours of Drama 396; 2 hours of Drama 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) 6
2. Arts and Humanities 6
3. Social Sciences 6
4. Intercultural Studies 3
   Courses to meet the above requirements must be selected from the list under the General University Requirements for graduation section of the WSU catalog.
5. Physical and Biological Sciences 36
   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; applied animal nutrition; physics including electricity, optics and sound; zoology or general biology.
6. Electives 3
   Total Hours Required 60

Bachelor of Science Degree in Veterinary Science

The Bachelor of Science degree in Veterinary Science combines credits earned in both the preprofessional and professional programs. The degree is available only to students who have been admitted to the professional program. This degree was designed to benefit veterinary medical students in obtaining employment, applying for scholarships, and qualifying for graduate-level course enrollments.

The minimum basic requirements for the degree are:

| Social Sciences, Arts and Humanities (not less than 6 hours in each field) | 12 |
| Communications Proficiency | 6 |
| Intercultural Studies | 3 |
| Physical and Biological Sciences and Recommended Electives | 39 |
| 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 | 60 |
| Total semester hours | 120 |

Schedule of Studies

Professional Curriculum

The professional curriculum for the Doctor of Veterinary Medicine degree is outlined below. A total of 145 semester hours are required for graduation. All courses required in the professional program are upper-division courses.

First Year

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<tr>
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<td>VA 405 Microanatomy</td>
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<td>VA 356 Prof Orient &amp; Ethics</td>
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<td>VA 519 Physiology I</td>
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<td>Second Semester</td>
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<td>VA 402 Gross Anatomy</td>
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<td>VA 518 Physiology II</td>
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<td>VA 526 Phys Lab</td>
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<td>VA 445 Gen Pathology</td>
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<td>VA 430 Immunology</td>
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<td>VA 517 Neuroscience</td>
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Second Year

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<td>VA 531 Pharmacology I</td>
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<td>VA 432 Bacteriology</td>
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<td>VA 451 Parasitology</td>
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<td>VA 532 Toxicology</td>
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<td>VA 431 Virology</td>
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<td>VA 481 Radiology</td>
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<td>VA 463 Sm An Med I</td>
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<td>VA 471 Intro to Surg</td>
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Third Year

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<td>VA 472 Sm An Surg</td>
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<td>VA 461 Lg An Med I</td>
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<tr>
<td>VA 433 Pub Health</td>
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<td>VA 377 L A Clinic Or Electives</td>
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<td>Second Semester</td>
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<td>VA 477 Therio</td>
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<td>VA 545 Spec An Med Electives</td>
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Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology

Fourth Year

Block System (4 wks./block) Hours
V MS 560 Sm An Medicine 4
V MS 565 Sm An Surgery 4
V MS 570 Equine Med & Surgery 4
V MS 575 Food An Med & Surg 4
V MS 580 Services 4
V MS 590 Externship (1 cr./block) 2
Elective Blocks (4 cr./block) 12
Senior Paper

A total of 145 credit hours are required for graduation. All courses listed above plus the completion of a Senior Paper are required for graduation.

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.

Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology


Description of Courses

For explanation see Index under "Symbols"

Anatomy

V An


350 Skeletal Preparation V 1-3 May be repeated for credit; cumulative maximum 3 hours. Technique of skeletal preparation.

401 Veterinary Anatomy 6 (1-15) Prereq admission to Vet Med or graduate student in Vet S. Detailed macroscopic functional morphology of domestic animals.

402 Veterinary Anatomy 2 (0-6) Prereq V An 401. Detailed macroscopic functional morphology of domestic animals.

405 Microscopic Anatomy 7 (5-6) 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)

515 Advanced Experimental Embryology 3 (1-6) Prereq Zool 320 or V An 405.
Gross morphological changes in mammalian development; events leading to abnormal development (congenital malformations). (a/y)

550 Research Principles and Methods of Anatomy 1 (0-3) 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 MS 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 and Ethics 2 Orientation to and ethics of the veterinary medical profession for first year veterinary students.

525 Special Topics in Veterinary and Comparative Pharmacology 1 (0-5) 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.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (For MS 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 Mammalian Neuroscience 4 (3-3) Prereq V Ph 519. Cellular, neural, and endocrine control systems in physiology.

518 Veterinary Physiology 4 Prereq V Ph 519. Physiology of domestic animals.

519 Veterinary Physiology 2 Prereq admission to Vet Med or graduate student in Vet S. Physiology of domestic animals; introductory cell biology, endocrinology, and reproduction.

520 Techniques in Mammalian Physiology 2 (1-3) Use of anesthetics and surgery. (a/y)

521 Cardiovascular 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 major in Vet Med or graduate student in Vet S. Laboratory experiments in mammalian physiology.

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 nervous system and their significance for normal and abnormal function. (a/y)

530 Neurochemical Techniques I (0-5) Prereq c// in V Ph 529. Techniques of major importance to the study of functional neurochemistry. (a/y)

534 Advanced Neurophysiology 3 Prereq V An 423. Nervous system from the molecular to the behavioral level; electrophysiology. (a/y)

535 Pathophysiology of Blood 3 (2-3) Physiology of erythron, hemostatic system and effector cells including granulocytes and natalon killer cells. (a/y)

536 Synaptic Organization of the Brain 3 Structure-function relations of synapses of local circuits of the mammalian brain. (a/y)

592 Research Topics in Physiology 2 Concepts and controversies within a specific and highly focused domain of physiological research.

600 Special Projects or Independent Study Variable credit.

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


Description of Courses

For explanation see Index under "Symbols"

V MS

261 Accidents and Diseases 3 For majors in agriculture. Common diseases 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 medications, and surgical dressing.

460 Laboratory Diagnosis 3 (2-3) Prereq 2nd year in Vet Med. Laboratory diagnostic procedures and interpretation.


462 Large Animal Medicine II 5 Prereq VMS 461. Diagnosis and treatment of large animal infectious diseases. Continuation of V MS 461.


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.


473 Surgery II 3 (2-3) Prereq V MS 472. Large animal surgical techniques.

477 Theriogenology 3 Prereq V MS 462. Diagnosis, symptomatology, and treatment of reproductive disorders.

478 Theriogenology Laboratory 1 (0-3) Prereq in V MS 477.


485 Diseases and Management of Pet and Wild Birds 2 (1-3) Prereq junior in Vet Med. Management and handling, diagnosis and treatment of various disease conditions of pet and wild birds.

489 Large Animal Preventive Medicine 3 Prereq 3rd year in Vet Med. Veterinarian's role in the interrelationship between management disease and productivity, and the quality of the marketed food or product.

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

521 Clinical Medicine II 4 (0-12) Prereq V MS 462. Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures. (OSU)

522 Clinical Surgery II 4 (0-12) Prereq V MS 473. Clinical surgery, treatment and care of food animals and horses; clinic rounds; surgery, lameness, and diagnostic procedures. (OSU)

523 Clinical Service II 4 (0-12) Prereq V MS 460. Rotation through pathology, radiology, microbiology, and necropsy. (OSU)

524 Rural Veterinary Practice II 4 (0-12) Prereq V MS 462. Farm calls provide on-the-farm instruction on food animals and horses; theriogenology and herd health instruction. (OSU)

525 Small Animal Medicine and Surgery Lab 4 (0-12) Prereq V MS 472. Orthopedic surgery, soft tissue surgery, specialty medicine, and emergency medicine and intensive care. (OSU)

526 Avian Medicine 4 (0-12) Prereq V Pa 454. Clinical and diagnostic experiences related to poultry and caged birds provided by rotation through diagnostic laboratory. (OSU)

527 Practice Management 4 (0-12) Prereq
4th year in Vet Med. Accounting personnel management, inventory control, legal documents, investments, computerized business procedures, human relations, financial management, business law and taxes. (OSU)

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; audio-visual aids.


576 Advanced Food Animal Medicine and Surgery 4 (0-12) Prereq V MS 575. Independent study; audio-visual aids. (Caldwell)

577 Advanced Theriogenology 4 (0-12) Prereq V MS 575. Reproductive herd health in cattle and swine; diagnostic techniques related to infertility.

578 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. (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 1 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 MS in veterinary science only.)

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

Department of Veterinary Microbiology and Pathology

Professor and Department Head, R. G. Browse; Professors, D. Burger, B. R. Cho, W. C. Davis, A. M. Gallina, J. R. Gorham, J. B. Henson, T. C. McGuire, L. B. Perryman, R. B. Wescott, R. B. Wilson; Associate Professors; K. L. Banks, W. P. Cheevers, L. B. Cor-
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 5 (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 3 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 and Immunogenetics 3 Prereq V Mic 430 or Bact 412. Genetic analysis of the immune response in vertebrates; ontogeny, phylogeny, mechanisms of immune regulation. (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 pursues 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 MS 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 diseases 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 430 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 relationships 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 MS 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**

**Acting Department Chair, M. S. Lilly; Professor, J. G. Guancara; Associate Professors, M. M. Oaks, B. L. Trout; Assistant Professors, G. Edmison, W. L. Holmes, B. J. Johnson, M. D. Kleene, R. R. Murphy, M. L. Riggers.**

The Department of Vocational Technical Education administers an undergraduate program leading to the Bachelor of Arts degree in Industrial Technology. This curriculum 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 within the department are combined with technical courses offered in engineering, fine arts, and business. The department also offers courses leading to the degree of Master of Science in Vocational Technical Education. Graduate study is designed to prepare students for professional careers in vocational education administration, teaching, and research. All graduate students are required to complete a common core of courses and have the option of specializing in agriculture, home economics, or industrial technology education. Additional work in related fields may be taken in other WSU departments or through exchange courses with the University of Idaho.

**Description of Courses**

*For explanation see Index under "Symbols"*

I Tec

110 Foundations of Industrial Education and Technology 2 History, goals, methods, curriculum, contemporary programs, and professional organizations.

130 Basic 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 (1 Ed ID 130).

131 Basic Electronics 3 (1-6) Prereq I Tec 130. Advanced electronics concepts and device applications to electronic systems. Cooperative course taught at the University of Idaho (1 Ed ID 131).

220 Industrial Education Design 3 (0-6) Prereq M E 101; Ag M 201. Design fundamentals; techniques, materials,
and tools employed in the fabrication of industrial products.

222 Woodworking Technology I 3 (0-6)
Prereq M E 101. Wood identification, design, and fabrication of wood products, basic finishing techniques and related materials.

322 Woodworking Technology II 3 (0-6)
Prereq I Tec 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 I Tec 222; M E 101.

333 Methods of Teaching Industrial Education 3 Prereq I Tec 110.

345/346 Industrial Safety and Hygiene 1 Safety and industrial hygiene principles; federal and state regulations. Required for vocational certification.

360 (250) Metal Technology I 3 (1-4) Prereq M E 101; Arch 101 or M E 102; Math 107; Ag M 201; I Tec 220. Manufacturing industrial products using basic technological processes.

380 (348) Metal Technology II 3 (1-4)
Prereq I Tec 360. Metal deposition and fusion fastening; oxyacetylene, tungsten inert gas (TIG), metallic inert gas (MIG); plasma arc and consumable electrode.

416 Transportation Technology 3 (1-6)
Prereq Ag M 313, 331, 416. Theory and practice related to recent transportation technology.

425 Woodworking Technology III 3 (1-4)
Prereq I Tec 222, 322. Mass production methodology, industrial organizations, design, jigs, fixture fabrication, cost accounting, marketing, product planning and fabrication.

426 Graphics Technology 3 (0-6) Prereq I Tec 220. Industrial graphics; equipment setup, job production, and machine maintenance.

433 Laboratory Organization and Management 3 (2-3) Prereq I Tec 333. Planning, organizing, and management of technical laboratories and facilities; shop safety. (A/Y)

440/444 Principles of Vocational Education 2 or 3 Prereq 9 hrs Educ. Local, state, and national vocational technical educational legislation, policies, programs, and organizations.

450 (350) Metal Technology III 3 (0-6)
Prereq I Tec 348, 350. Manufacturing industrial products using advanced technological procedures and the small team production method (Task Force Production).

464 Management of Laboratory Equipment 3 (0-6) Prereq I Tec 350, 450. Installation, calibration, maintenance, and restoration of laboratory equipment.

470 Directed 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.

486 Applied Industrial Laboratory Procedures V 1 (0-2) to 3 (0-6) May be repeated for credit; cumulative maximum 6 hours. Prereq I Tec 222, 355, 350; Ag M 331. Introduction to applied industrial processes; construction of test apparatus; seminars.

488 Curriculum Materials in Industrial Education 3 Prereq 12 hours I Tec; I Tec 333.

490 Instructional Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours.

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

**Schedule of Studies**

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.

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>I Tec 222 Wood Tech</td>
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<td>Psych 102 Human Behavior</td>
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### Supervision-Management Option

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<tr>
<td>I Tec 325 Bldg Constr</td>
<td>3</td>
</tr>
<tr>
<td>I Tec 486 Appl Lab Proc</td>
<td>3</td>
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<tr>
<td>I Tec 333 Meth Tchg I Ed</td>
<td>3</td>
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<tr>
<td>Cpt S 150 Programming</td>
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</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I Tec 425 Wood Tech III</td>
<td>3</td>
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<tr>
<td>I Tec 464 Mgt Lab Equip</td>
<td>3</td>
</tr>
<tr>
<td>I Tec 433 Lab Org &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>Approved Technical Elective</td>
<td>15</td>
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<tr>
<td>Psych 306 Industrial</td>
<td>3</td>
</tr>
<tr>
<td>Mgr 301 Mgmt &amp; Org</td>
<td>3</td>
</tr>
</tbody>
</table>

### Description of Courses

For explanation see Index under "Symbols"

Vocational Technical Education

VTE

478 Career Development and Vocational Guidance for the Handicapped 3 Same as Educ 478.

501 Seminar in Vocational Education 1-3
Program in Women Studies

May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs VTE. Joint course taught with the University of Idaho (Voc Ed ID 501).

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 (Voc Ed ID 504).

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 (Voc Ed ID 507).

510 Microcomputers in the Classroom: Implications and Applications 3 For experienced vocational classroom teachers who are initial microcomputer users. In-depth investigation into philosophical implications, educational software, hardware, instructional strategies, curriculum planning and evaluation. (SS)

512 Curriculum Development in Vocational Education 3 Prereq I Tec 440. Curriculum construction; occupational analysis; selection and organization of instructional materials.

515 Instructional Strategies 3 Principles, concepts, and aims and application of teaching strategies.

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 (Voc Ed ID 504).

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 educational programs. Joint course taught with the University of Idaho (Voc Ed ID 543).

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 (Voc Ed ID 544).

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 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 (Voc Ed ID 571).

586 Management of Facility Planning 3 Same as Educ 586.

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 roles, lives, 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 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.
210 Coping with Technology 3 Developing skills for overcoming anxieties about math, computers, and the effects of new technologies on our lifestyles, environment, and physiology.
230 Human Sexuality 5 Same as Psych 230.
247 Human Development II 3 Same as CFS 247.
290 Women and Work: Choices and Changes 2 New skills for the workplace based on study of historical and psychological factors influencing contemporary attitudes; personal career options assessed.
298 [S] 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 Gender and Politics 3 Same as Pol S 305.
310 Women Artists 3 Women's art, historical through contemporary.
315 Women in Management 3 Analysis of women's historical and contemporary role in American management.
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 The Family 3 Same as Soc 351.
355 Women Writers 3 Same as Engl 355.
384 Sociology of Sex Roles 3 Same as Soc 384.
398 History of Women in the American West 3 Same as Hist 398.
402 Introduction to Kinship Studies 3 Same as Anth 402.
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 Wildlife and Wildland Recreation Management, 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 Animal Natural History 2 Identification, life history, and behavior of animals commonly found in the Pacific Northwest.
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.


251 Introductory Human Physiology 4 (3-3) Prereq 1 sem Chem. Mechanics of basic functions; an introduction to biophysical and biochemical processes.


310 Aquatic Ecology 3 (2-3) Prereq Bio S 104. 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.


330 (B) Principles of Conservation 3 Prereq Bio S 101, 102, 103, or Bact 101. Conservation of major natural resources through a biological approach; philosophical, economic, and political aspects of important conservation issues.

340 Wildlife Field Studies 1 (0-3) Prereq Zool 230. Seven-day trip (spring vacation) to observe and discuss wildlife research and management by regional, federal, and state conservation agencies.

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.

405 Principles of Organic Evolution 2 Prereq GenCB 301. Principles, patterns, processes, and mechanisms of evolution with respect to organized systems. Credit not granted for both Zool 205 and 405.

408 Introduction to Mathematical Biology 3 Prereq Math 140 or 171; 3 sem biology. Fundamental mathematical principles applied to the study of biological systems.

412 (335) Biology and Management of Fishes 3 (2-3) Prereq Bio S 104. Evolution, identification, life history, and management of important fish species. (a/y)

414 Fishery Ecology 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 (Fish 1D 413).

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 strat-
egies; interactions between man and the lower vertebrates.

432 Wildlife Nutrition 3 (2-3) Prerequisite Org Chem. Nutritional requirements and interactions of wildlife populations. Credit not granted for both Zool 432 and 532.


438 Animal Behavior 3 (2-3) Prerequisite Zool 224. The biological study of animal behavior as viewed from ethological, genetic, developmental, ecological, and evolutionary perspectives.

440 Radiation Ecology 2 (3-3) Prerequisite Zool 528. The fate and effect of radionuclides in the natural environment. (a/y)

448 Evolutionary Ecology of Populations 3 (2-2) Prerequisite 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.

451 Comparative Vertebrate Reproduction 3 (2-2) Prerequisite Bio S 104. Physiology of major events in reproductive cycles of vertebrates, emphasizing mammals. Credit not granted for both Zool 451 and 551. Cooperative course taught at the University of Idaho (Zool ID 411).

497 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 6 hours. Academic traineeship in laboratory teaching and tutoring.

498 Career Experience Internship V 2-4 May be repeated for credit; cumulative maximum 4 hours. By interview only. Experience in work related to specific career option area.

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

501 Raptor Ecology 2 The natural history of North American raptoriform birds; population dynamics and food habits. Cooperative course taught at the University of Idaho (Zool ID 532).

503 Workshop: Wildlife Topics 2 May be repeated for credit; cumulative maximum 10 hours. Prerequisite Zool 435. Selected topics in the conservation and management of wildlife. Cooperative course taught at the University of Idaho (WLF ID 503).

505 Generation, Degeneration, Regeneration in the Nervous System 2 Prerequisite; plasticity and specificity of neural connections of invertebrates and vertebrates. (a/y) Cooperative course taught at the University of Idaho (Zool ID 501).

506 Electron Microscope Laboratory 3 (0-9) Prerequisite: 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) Prerequisite Zool 322. Adaptations of invertebrates to their environment. (a/y)

511 Principles of Systematic Biology 3 (2-3) Prerequisite 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) Prerequisite. 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. (a/y) Cooperative course taught at the University of Idaho (Fish ID 510).

527 Radioactive Tracer Techniques 2 (1-3) Use of radioisotopes in biological research.

530 Statistical Ecology 3 Prerequisite 3 hrs Bio I, Bio II. Collection and interpretation of ecological data according to biometrical procedures. (a/y)

531 Mathematical Ecology 3 Prerequisite courses 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 432; additional requirements. Credit not granted for both Zool 432 and 532.

536 Advanced Wildlife Management 4 (3-3) Graduate level counterpart of Zool 436; additional requirements. Credit not granted for both Zool 436 and 536.

540 Waterfowl Ecology and Management
Department of Zoology

3 (2-3) Selected literature on North American waterfowl ecology and management. (a/y)

544 Big Game Management 3 Prereq Zool 435. Big game species and their populations and habits; objective balance of the components of habitats with population levels. Cooperative course taught at the University of Idaho (WLF ID 544).

546 Upland Game Ecology 2 Prereq Zool 435. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. (a/y) Cooperative course taught at the University of Idaho (WLF ID 546).

548 Evolutionary Ecology of Populations 3 Graduate level counterpart of Zool 448; additional requirements. Credit not granted for both Zool 448 and 548.

551 Comparative Vertebrate Reproduction 3 Graduate level counterpart of Zool 451; additional requirements. Credit not granted for both Zool 451 and 551. Cooperative course taught at the University of Idaho (Zool ID 511).

552 Comparative Physiology I 4 (3-3) Prereq Zool 322, 352, or 353; 8 additional hrs Bio S or Ph S. Adaptations of excretion, respiration, circulation, and metabolism in vertebrate and invertebrate animals. (a/y)

553 Comparative Physiology II 4 (3-3) Prereq Zool 322, 352, or 353. Neural and endocrine systems; their role in coordinating body functions in vertebrate and invertebrate animals (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; Zool 353 or V Ph 318. Principles of vertebrate physiology illustrated through contemporary analytical and instrumental procedures. (a/y)

560 Environmental Physiology 3 Prereq Zool 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 Zool 560 or c/. Measuring physiological response to environmental variation.

573 Cellular and Molecular Aspects of Development 3 Prereq Zool 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 Zool 320 or 573 or c/. Experiments on sea urchin, amphibian and chicken embryos; tissue culture techniques in developmental biology. (a/y)

586 Special Projects in Electron Microscopy V 2-3 May be repeated for credit; cumulative maximum 10 hours. By interview only. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing, darkroom procedures.

587 Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

588 Advanced Topics in Wildlife 1-3 May be repeated for credit; cumulative maximum 10 hours. Biology and management of wildlife species. Joint listing with the University of Idaho (For ID 503).

589 Advanced Topics in Zoology I 2 May be repeated for credit; cumulative maximum in Zool 589, 590-10 hours. Recent advances in zoology.

590 Advanced Topics in Zoology II 2 May be repeated for credit; cumulative maximum in Zool 589, 590-10 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 Zool. 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.

ZOOLGY OPTION

Students interested in preparing for professional or graduate work should follow this option.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 201 or 301 or 402</td>
<td>3</td>
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<tr>
<td>Chemistry, including Organic</td>
<td>14</td>
</tr>
<tr>
<td>Physic</td>
<td>8</td>
</tr>
<tr>
<td>Math 107 and a course in calculus</td>
<td>6-9</td>
</tr>
<tr>
<td>Math 172 or Biom 412 or Zool 408</td>
<td>3-4</td>
</tr>
<tr>
<td>Cpt S</td>
<td>2-4</td>
</tr>
<tr>
<td>Foreign Language—two semesters in one language at the college level or two years in high school or the intensive summer course</td>
<td>8</td>
</tr>
<tr>
<td>Bio S 103, 104</td>
<td>8</td>
</tr>
<tr>
<td>Bot 320 or 332, or Bact 201</td>
<td>3-5</td>
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<tr>
<td>GenCB 301</td>
<td>3</td>
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<tr>
<td>Zool 224, 225</td>
<td>4</td>
</tr>
<tr>
<td>Zool 320</td>
<td>4</td>
</tr>
<tr>
<td>Zool 310 or 330 or Bio S 372</td>
<td>3-4</td>
</tr>
<tr>
<td>Zool 322 or 324</td>
<td>4</td>
</tr>
<tr>
<td>Zool 352 or 353 or 450</td>
<td>3-4</td>
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<tr>
<td>Zool 393</td>
<td>1</td>
</tr>
<tr>
<td>Zool 405</td>
<td>2</td>
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<tr>
<td>One from Zool 335, 417, 423, 428, 430, Entom 434, 448</td>
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Electives, General University and College of Sciences and Arts Requirements

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

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Arts, humanities, social sciences (including economics)</td>
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<tr>
<td>Foreign Language (or 2 yrs in HS)</td>
<td>8</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>
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<tr>
<td>Phys 101, 102</td>
<td>8</td>
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<tr>
<td>Chem 105, 106, 107, 240</td>
<td>13</td>
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<tr>
<td>Math 107, 171, or 202</td>
<td>7</td>
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<tr>
<td>Bio S 103, 104</td>
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<tr>
<td>Zool 224, 225</td>
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<tr>
<td>Zool 390 Research Methods</td>
<td>4</td>
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<tr>
<td>Zool 393 Seminar</td>
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<tr>
<td>Zool 398 Summer Internship</td>
<td>4</td>
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<tr>
<td>Zool 499 Senior Project</td>
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</table>

1. BIOMEDICAL COMPUTATION—44-45 hours

<table>
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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>
<td>18</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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<tr>
<td>Zool 320, 322, 324, or 315</td>
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<tr>
<td>Zool 310, 330, or Bio S 372</td>
<td>3-4</td>
</tr>
<tr>
<td>Zool 352, 353, or 450</td>
<td>4</td>
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<tr>
<td>Zool 408 Math Biology</td>
<td>3</td>
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2. MICROSTRUCTURE AND ANALYTICAL METHODS—36-37 hours

<table>
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<tr>
<td>Chem 217 Quant Analysis</td>
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<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Phys 410</td>
<td>3</td>
</tr>
<tr>
<td>Zool 320, 322, or 324</td>
<td>4</td>
</tr>
<tr>
<td>Zool 420 or 450</td>
<td>4-5</td>
</tr>
<tr>
<td>Zool 352 or 353</td>
<td>4</td>
</tr>
<tr>
<td>Zool 427 Radioactive Tracer Tech</td>
<td>2</td>
</tr>
<tr>
<td>Bact 201 Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>GenCB 301 Genetics</td>
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3. BIOMEDICAL SALES—42-43 hours

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<thead>
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<tr>
<td>Bact 101 Bacteriology</td>
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<tr>
<td>BC/BP 364 Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>Phys 410 Electronics</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 150, 151</td>
<td>4</td>
</tr>
<tr>
<td>QMeth 215 Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
<td>3</td>
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<tr>
<td>Mktg 477 Promotion Mgt</td>
<td>3</td>
</tr>
<tr>
<td>Pharr 311 or 467</td>
<td>3-4</td>
</tr>
<tr>
<td>GenCB 301 Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Zool 315 Gross/Micro Hum Anat</td>
<td>3</td>
</tr>
<tr>
<td>Zool 353 Vertebrate Phys</td>
<td>4</td>
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4. ANIMAL SUPERVISION—40 hours

<table>
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<tbody>
<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Pharr 311 Pharmaceutics</td>
<td>4</td>
</tr>
<tr>
<td>Zool 324 Comp Vertebrate Anat</td>
<td>4</td>
</tr>
<tr>
<td>Zool 353 Vertebrate Phys</td>
<td>4</td>
</tr>
<tr>
<td>Zool 432 Wildlife Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Zool 417 Parasitology</td>
<td>4</td>
</tr>
<tr>
<td>Zool 438 Animal Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Bact 101 Bacteriology</td>
<td>4</td>
</tr>
<tr>
<td>VMS 261 Accidents and Diseases</td>
<td>3</td>
</tr>
<tr>
<td>A S 350 or GenCB 301</td>
<td>3</td>
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</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>
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</table>

TOTAL 349
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 280, 328, 432, 435, 436, and 7 additional hours of Zoology and/or Botany.
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# Washington State University Academic Calendar

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<td>Aug. 21-22</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Aug. 25</td>
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<tr>
<td>Labor Day—Classes will meet</td>
<td>Sept. 1</td>
</tr>
<tr>
<td>Midsemester grades due in Registrar's Office</td>
<td>Oct. 10</td>
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<tr>
<td>8:00 a.m., Friday</td>
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<tr>
<td>Thanksgiving vacation begins, 12:00 noon, Saturday</td>
<td>Nov. 22</td>
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<tr>
<td>Thanksgiving vacation ends, 8:00 a.m., Monday</td>
<td>Dec. 1</td>
</tr>
<tr>
<td>Final Examinations, Saturday through Friday</td>
<td>Dec. 13-19</td>
</tr>
<tr>
<td>Final grades due in Registrar's Office</td>
<td>Dec. 22</td>
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<tr>
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<tr>
<td>Classes begin, Monday</td>
<td>Jan. 12</td>
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<tr>
<td>Midsemester grades due in Registrar's Office</td>
<td>Feb. 27</td>
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<tr>
<td>Spring vacation begins, 12:00 noon, Saturday</td>
<td>Mar. 7</td>
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<tr>
<td>Spring vacation ends, 8:00 a.m., Monday</td>
<td>Mar. 16</td>
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<tr>
<td>Final Examinations, Saturday through Friday</td>
<td>May 2-8</td>
</tr>
<tr>
<td>Commencement, 9:00 a.m., Saturday</td>
<td>May 9</td>
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<tr>
<td>Final grades due in Registrar's Office</td>
<td>May 11</td>
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<td>8:00 a.m., Monday</td>
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<tr>
<td>Registration, Monday</td>
<td>June 8</td>
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<td>Classes begin, Tuesday</td>
<td>June 9</td>
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<tr>
<td>Independence Day (a holiday)</td>
<td>July 4</td>
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<td>Six-week session ends, Friday</td>
<td>July 17</td>
</tr>
<tr>
<td>Eight-week session ends, Friday</td>
<td>July 31</td>
</tr>
<tr>
<td>Final grades due in Registrar's Office</td>
<td>Aug. 3</td>
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<tr>
<td>8:00 a.m., Monday</td>
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CERTIFICATION

SELECTIVE MAJOR CERTIFICATION REQUIREMENTS

Several academic programs are unable to accept all qualified students according to selected enrollment limitations. These include architecture, fine arts; business administration, hotel administration; communications, interior design; computer science, landscape architecture; construction management, nursing; economics, pharmacy; education, veterinary medicine; engineering.

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. Students may review certification criteria in the Catalog/Catalog Supplement, or contact the department above for additional information.

ENROLLMENT RESTRICTIONS. Many 300- and 400-level courses in these departments are open to certified majors only. These restrictions are listed under the COURSE DESCRIPTION section of this supplement and in the Catalog.

•College of Business and Economics

Certification requirements for business administration, economics, and hotel administration are listed in the Catalog; further details are available in Todd 241 or 243. Each fall the current standards for certification are published in this supplement.

In addition to the 40-hour requirement, one of the following g.p.a. combinations is required: for assured certification:

A. 2.8 cumulative g.p.a. AND 2.4 business g.p.a.

Based on at least 6 hours of core classes (i.e., B Law 210, Acctg 230 and 231, QMeth 215, Econ 102, 103, and 301; Mgt 301, 340, and 350; Fin 325, Mktg 390)

OR

B. 2.8 business g.p.a. AND 2.4 cumulative g.p.a.

Based on at least 15 hours of the above business core classes

•Pre-major in Education

Requirements for certification as a pre-major in Education

2.3 cumulative gpa and completion of at least 30 semester hours of credit.

Rationale for the classification

The Department of Education now requires all elementary and secondary students seeking certification as a major in Education after September, 1984, to: (a) have completed at least 30 semester hours of credit with a cumulative g.p.a. of 2.5 or above, and (b) have successfully completed the Pre-Professional Skills Test. Secondary and elementary students who meet the g.p.a. criterion, but not the basic skills or speech proficiency, will be eligible to certify after completing a block of approved courses with grades of B- or above, in whichever area(s) they are deficient. Currently, it is department policy that students must be certified in the department in order to enroll in Education courses.

The above requirements unduly penalize transfer students who are not in a position to have completed the Pre-Professional Skills Test before coming to WSU, but have completed much of their academic major/minor course work. Thus, transfer students may be forced to "mark time" during their first semester at WSU until the requirements can be completed, and in fact, may be discouraged from coming at all.

The development of a pre-major in Education would provide an advantage to students in several ways: their records would be transferred to the department; thus, they would be advised and assisted by departmental faculty and credentialing personnel early enough to progress in an orderly fashion upon formal certification; furthermore, they would be permitted to enroll in one required Education course, if necessary, before completion of the certification process. The department would be in a better position to identify students who ought to be actively encouraged to pursue Education, as well as those who should be encouraged to pursue avenues other than teaching.

Implementation

1. Students desiring a major in Elementary Education will qualify for the pre-major for Elementary Education if he/she meets the above requirements of 2.3 cumulative g.p.a. with at least 30 hours of credit. Students interested in a secondary major will certify in both the pre-major in Education and the academic major department.

2. All pre-majors in Education will be eligible to take the Pre-Professional Skills Test. Transfer students who have not completed the Pre-Professional Skills Test should take it during the first semester of enrollment at WSU.

3. Students will be dropped from the pre-major in Education after two semesters if they do not meet the regular requirements for admission to Education.

4. Any exception to the above policy must be approved by petition.

COURSE CHALLENGE

Currently enrolled students may petition to receive credit by challenge exam if eligible under Academic Regulations, Rule 15(c).

Procedure. Students wishing to challenge should pick up a Course Challenge Form at the Registrar's Office, obtain the approval (signature) of the chairperson of the department offering the course, pay the $75 fee, and return the completed form to the Registrar's Office. The student's academic record will be evaluated to determine eligibility for the challenge exam according to Rule 15(c). The Registrar will notify the student and the department if the examination is authorized.

The list below indicates the availability of courses for challenge. Courses such as 499 Special Problems, internships, and seminars may not be challenged for credit. The symbol (+) indicates ALL undergraduate courses are available for challenge. The symbol (-) indicates NO courses are available for challenge.

Adult and Continuing Education: (-)
Aerospace Studies: Aero 101, 102, 201, 202
Agricultural Economics: Ag Ec 335, 340, 350, 360
Agricultural Engineering: all undergraduate courses EXCEPT Ag E 154, 455, 456
Agricultural Mechanization: all undergraduate courses EXCEPT Ag M 403, 481, 490
Agronomy: all undergraduate courses EXCEPT Agron 405, 411, 469
Animal Sciences: A S 101, 213, 301, 350
Anthropology: (+)
Architecture: (-)
Asian American Studies: (-)
Astronomy: Astr 135
Biochemistry/Biophysics: (-)
Biology: Bio S 101, 102, 103, 104
Black Studies: (-)
Botany: all undergraduate courses EXCEPT Bot 410, 463
Business: Acctg 230, B Law 210, Fin 325, Ins 320, Mgt 201, 301, 340, Mktg 350, QMeth 215, 344, 412, 417, 444, RE 305
Chemical Engineering: (+)
Chemical Physics: Ch P 481
Chemistry: (-)
Chicano Studies: Ch St S 324, 325
Child and Family Studies: (-)
Civil and Environmental Engineering: (+) EXCEPT laboratory courses
Clothing, Interior Design, and Textiles: G T 216
Communications: (-)
Computer Science: (+)
Criminal Justice: (+)
Economics: Econ 102, 201, 203, 301, 320
Electrical Engineering: (+) EXCEPT laboratory courses
English: all undergraduate courses EXCEPT Engl 103, 104, 105, 301, 401, 402, 403
Entomology: (+) EXCEPT Idaho courses
Environmental Science: Env S 101
Fine Arts: F A 104, 201, 202, 203, 204, 300, 301, 302, 303, 304, 305
Food Science and Human Nutrition: (+) EXCEPT laboratory courses
Foreign Languages and Literatures: all undergraduate courses EXCEPT 
those numbered 101, 102, 103, 104; Fren 401, Ger 401, Rus 320, 321, Span 320
Forestry and Range Management: FRM 301, 304, 320, 330, 351, 352, 380, 412, 452
General Agriculture and Home Economics: (--)
Genetics and Cell Biology: GenCB 201, 301
Geology: Geol 402, 403, 421, 430, 440, 470, 475, 480
History: all undergraduate courses EXCEPT Hist 199, 210, 300, 427, 429, 439, 459, 480, 497
Honors: (--)
Horticulture: Hort 101, 130, 134, 251, 313, 320
Hotel and Restaurant Administration: HA 311
Humanities: Hum 100, 101, 202, 204
Industrial Technology: all 100- to 400-level technical (studio) courses
Landscape Architecture: (--)
Materials Science and Engineering: all undergraduate courses EXCEPT
MSE 220, 222, 223, 224, 225, 226, 450
Mathematics: all undergraduate courses EXCEPT Math 101, 103, 107, 116, 198, 200, 300, 330, 398, 431
Mechanical Engineering: (+)
Microbiology: (--)
Military Science: (+)
Native American Studies: Na Am 101
Nursing: Nurs 310, 312, 320, 321, 330, 340, 341, 420, 421, 450, 451
Pharmacy: Phar 217, 342, 417, 419, 436, 464, 471, 472, 482, 484
Philosophy: Phil 101, 201
Physical Education: Activity Courses (--); all 100- and 200-level PEP
courses (excluding laboratory courses)
Physics: all undergraduate courses EXCEPT Phys 101, 102, 201, 202, 310, 380, 410
Plant Pathology: (--)
Political Science: Pol S 101, 102, 206, 222
Psychology: (--)
Sociology: all undergraduate courses EXCEPT Soc 320, 321, 410, 420, 421
Soils: all undergraduate courses EXCEPT Soils 401, 404, 406, 407, 411, 417, 418
Speech: (--)
Veterinary Anatomy: (--)
Veterinary Clinical Medicine and Surgery: (--)
Veterinary Microbiology and Pathology: (--)
Veterinary Pharmacology and Physiology: (+) EXCEPT laboratory courses
Women Studies: (--)
Zoology: (--)

APPROVED STUDENT ABSENCES FROM CLASSES

Policy regarding approved student absences from class was passed by the Faculty Senate at its November 21, 1983 meeting. That policy is as follows:

Guidelines for Class Absences: Students who are required to participate in off-campus, university-sponsored activities such as field trips, musical performances, judging teams, intercollegiate athletic events, etc., should obtain an official "Class Absence Request" form from either the faculty or staff member supervising the off-campus activity. The form must contain specific information concerning the activity and date, be signed by the supervising faculty or staff member, and be submitted by the student, at least one week in advance, to the individual instructors of the student's classes.

It is requested that students not be penalized for absence from class provided a properly signed Class Absence Request form has been filed with instructor prior to the absence. In all instances, it is the student's responsibility to make up all work missed. Problem cases should follow the Academic Complaint Procedures, Rule 104.

FIELD TRIP GUIDELINES

For classes or other instances in which students are expected to participate in field trips, this expectation should be included in the catalog and/or course syllabus. For classes, the reference to the field trip listed in the course syllabus should include any required fees, how travel would be accomplished, alternatives (if any), and the consequences of not participating in the field trip.

When travel is required, the responsible faculty or staff member should arrange for the transportation. If classes are to be missed, the responsible faculty or staff member should also provide the student participants with a statement concerning absence from classes that can be given to the students' instructors. Transportation can be scheduled through the university motor pool in accordance with section 80.49, Business Policies and Procedures Manual. The university's liability coverage is provided by Chapter 4.82 of the Revised Code of Washington (RCW). In those instances where students are permitted to drive their own cars and other students are permitted to ride with them, the responsible faculty or staff, acting as the university's representative, should request the student driver to verify that:

1. He/she has a valid driver's license.
2. He/she has minimum liability insurance required by the state of Washington ($25,000 bodily injury per person, $50,000 per accident, $10,000 property damage).
3. The student driver's vehicle meets the state's standard safety requirements.
4. The passenger capacity of the vehicle will not be exceeded.

The supervising university representative should also ensure that participants are appropriately dressed and properly advised as to safety requirements for the activity involved.

MINOR OR SECOND MAJOR

(Academic Regulations, Rule 64)

A student who has completed 90 semester hours may certify a minor or second major with the approval of the department offering the second major or minor.

Any department or program with an approved major may offer a second major. Departments or programs wishing to offer a minor must submit a request listing the required courses to the Catalog Subcommittee for approval.

Minors have been approved to date in the following areas: aging, agricultural economics, agricultural marketing, agronomy, alcohol studies, American studies, animal sciences, anthropology, Asian/Pacific American studies, Asian studies, astronomy, biochemistry/biophysics, biology, Black studies, business administration, chemistry, Chicano studies, child and family studies, classical studies, clothing and textiles, communications, computer science, criminal justice, economics, electrical engineering, English, entomology, fine arts, food science, foreign languages, geology, history, horticulture, human nutrition and foods, mathematics, military science, music, Native American studies, philosophy, physics, political science, psychology, religious studies, Russian area studies, sociology, social work, speech, wildlife biology, women studies, zoology.
SPECIAL PROBLEMS — 499

The following definition of undergraduates special problems courses is listed for the convenience of students in making plans prior to registration for independent study. Courses numbered 499 Special Problems are for undergraduates only. They are designed to provide students with an opportunity to pursue independent study interests not readily available through conventional course offerings. Prior to enrollment for a Special Problems course, students must (1) crystallize an independent study intent and design, (2) negotiate a proposal including credit value (from 1 to 4) with the faculty member under whose jurisdiction the Special Problem will be conducted, and (3) have the proposal approved by the department head and filed with the student's records. Upon completion, normally within the term, Special Problems courses are graded S or F and may be repeated for credit in subsequent terms. Maximum credit per semester, per department may not exceed four credits. The following categories represent the normal type of independent study undertaken as a Special Problem.

1. Research studies dealing with technical or specialized problems.
2. Selection and analysis of reading related to a specific subject, theme, concept, or interdisciplinary topic.
3. The further development of a skill or aptitude through a creative project in the arts, sciences, or humanities.
4. Off-campus field experience or other non-traditional learning experiences not available through conventional offerings.

GENERAL UNIVERSITY REQUIREMENTS FOR GRADUATION

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<th>SOCIAL SCIENCES</th>
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**Political Science** | 101, 102, 186, 222, 333 |
| **Psychology**     | 105, 198, 350, 355 |
| **Sociology**      | 101, 102, 198, 331, 350, 355 |
| **Women Studies**  | 200, 298 |

**I**

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<th>INTERCULTURAL STUDIES*</th>
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<tr>
<td><strong>Anthropology</strong></td>
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*INTERCULTURAL STUDIES. Effective with the entering freshman class of Fall 1985, 3 hours designated as meeting the GUR in Intercultural Studies will be required for graduation.

In addition to those courses designated above as [I], [G], and [K], the Faculty Senate has established the following alternative to fulfilling the Intercultural Studies General University Requirement:

 Students who successfully complete foreign study programs in non-Western cultures under the auspices of the Washington State University Office of International Education, or in institutions approved by the Office of Admissions, will have fulfilled the three-hour GUR requirement in Intercultural Studies.

(U) Course includes laboratory work.

[G] Course meets GUR in either Intercultural studies or humanities.

[K] Course meets GUR in either Intercultural studies or social sciences.

[U] Course meets GUR in either sciences or social sciences.
COURSE DESCRIPTIONS

Additions and Changes. The following is a composite list which includes course changes approved since the publication of the 1985-87 Catalog. New and dropped courses are identified under the course number; other courses have changes such as number, title, credit, prerequisites or description.

The 1986 Fall Time Schedule lists courses to be taught the fall semester as well as a tentative list of courses for spring.

The 1987 Spring Time Schedule will be published in December.

SYMBOL KEY

New The word "new" printed directly under the course number indicates the course was approved since publication of the current catalog.

Drop The word "drop" printed directly under the course number indicates the course has been dropped.

210 (101) Changes in course number appear under the new number with the old number following in parentheses.

3 The number following the course title indicates the hours of credit.

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

(a/ y) Course is taught alternate years.

(SS) Course is taught summer only.

c// Concurrent enrollment.

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

[B] Letter in brackets following the course number indicates course partially meets a General University Requirement for Graduation, i.e., [B] biological sciences; [C] communication proficiency; [G] intercultural studies or humanities; [H] humanities; [I] intercultural studies; [K] intercultural studies or social sciences; [P] physical sciences; [S] social sciences; [U] sciences or social sciences; [W] written communication; [Z] sciences.

Accounting

Acctg 232 (330) Intermediate Accounting I 3 Prereq Acctg 230. Theory underlying the determination of income; analysis of financial statements.


338 Cost Accounting 3 Prereq Math 201, 202; QMeth 215; Acctg 231. Management uses of cost information; cost systems and system design; cost analysis.

433 Accounting Systems 3 Prereq Acctg 232, 338; Cpt S 105; Mgt 350. Accounting systems design; internal control and computerization.

438 Advanced Cost/Managerial Accounting 3 drop

539 Auditing 3 Prereq Acctg 331, 338, 433; Cpt S 105; Mgt 350. Nature of auditing, generally accepted auditing standards, and audit procedures as related to auditing of financial statements by independent accountants.

535 Taxation of Partners and Partnerships 3 Prereq Acctg 335. Federal income tax impact on partners and partnerships of forming, operating, and liquidating partnerships.

536 Taxation of Corporations and Stockholders 3 Prereq Acctg 335. Federal income tax impact on corporations and their stockholders from forming, operating, and liquidating corporations.

537 Estate Planning 3 Federal estate and gift new taxation and income taxation of estates, trusts, and beneficiaries.

Accounting and Business Law—Law and Public Policy

Preparation for careers in consulates, embassies and the State Department; in criminal justice administration, court administration, public utility administration, labor union administration, and government agency administration; also private businesses dealing with the foregoing.

Junior and senior years: 15 hours of upper division courses from the College of Business and Economics, 18 upper division hours from the College of Sciences and Arts. For specific course requirements contact the College of Business and Economics.

Adult and Continuing Education

(See Adult and Youth Education)

Adult and Youth Education

ACE 508 Foundations of Continuing Education new 3 Historical, philosophical, social, and economic factors that influence education in continuing adult and youth environments.

509 Internship in Adult and Continuing Education V 2-16 May be repeated for credit; cumulative maximum 16 hours. Internship experience in adult and continuing education settings. S, F grading.

Agribusiness—new major leading to Bachelor of Science in Agribusiness.

AgHE 333 Methods of Teaching Home Economics 2 or 3 Prereq EI/Se 305 or c/; 18 hrs H E. Curriculum development and instructional strategies for teaching home economics.

403 Professional Perspectives 3 Prereq FSHN new 130 or 233; CFS 240 or 247; 1 D 101 or 202. Interdisciplinary problem solving approach to individual and family issues; professional development in home economics specialties.

471 Student Organizations 2 drop

VTE 501 Seminar in Vocational Education 1-3 drop

507 Foundations of Vocational Education 3 drop (Idaho)

507 Foundations of Vocational Education 3 new (Idaho)

531 Special Topics in Vocationa Agriculture drop 1-3

533 Special Topics in Distributive Education drop 1-3 (Idaho)

544 Modifying Vocational Programs for drop Students with Special Needs 3 (Idaho)

571 Accessing, Organizing, and Synthesizing drop Data 3 (Idaho)
Agricultural Economics

Ag Ec
210 Agricultural Information System 2(1-3)
Sources and interpretation of data used in agricultural economics; use of microcomputers to process, organize, and present economic information.
362 Cooperatives in the Agribusiness Industry new 2 Prereq Accct 230. Organization, financing, management, and member relations in agricultural supply and marketing cooperatives.
380 Introduction to Resource Economics 2 drop
425/525 Economic Analysis of Public Projects and Policies 3 Prereq 300-level course in Econ or Ag Ec. Principles and procedures for evaluating public sector projects and policies using cost-benefit analysis and related economic approaches. Credit not granted for both Ag Ec 425 and 525.
453 International Marketing of Agricultural Products 3 Prereq Econ 205; 1 Bus 380. Application of economic theory and marketing techniques to the analysis of international agricultural trade.
480 Resource Economics 3 Prereq 300-level course in Econ or Ag Ec. Economic principles applied to natural resource problems; issues and policies.
580 Advanced Resource Economics 3 Prereq Econ 501. Economics analysis of the allocation and use of environmental and natural resources.
581 Advanced Topics in Resource Economics 3 Prereq Ag Ec 580. Theoretical underpinnings of advanced topics in resource economics.

Agricultural Engineering

Ag E
341 Hydrology 3 Precipitation and runoff events; principles of climatology, evaporation, infiltration, and snowmelt. Cooperative course taught at the University of Idaho (AgE ID351).
485/585 Environmental Systems Design 3 Prereq Math 172. Systems engineering approach to design of livestock production, crop processing, and storage facilities. Credit not granted for both Ag E 485 and 585. Cooperative course taught at the University of Idaho (AgE ID469/569).
595 Water Resources Seminar 1 drop
596 Graduate Seminar I May be repeated for credit. Required of all graduate students in agricultural engineering. S, F grading.

Agricultural Mechanization

Ag M
101 Oxy-Acetylene Welding I(0-2) Operation, use, and cooperative course taught at the University of Idaho (AgMech ID101).
102 Arc Welding 2(1-2) Operation, use, and care of equipment. Cooperative course taught at the University of Idaho (AgMech ID107).

Agronomy

Agron
303 Grain Crops 3 Prereq Bot 120 or Bio S 104; Agron 201. Adaptation, production, and utilization of cereals, grain legumes, and oilseed crops. Field trip required.
304 Cereal Products 2 Same as FSHN 304. drop
305 Principles of Weed Science 3(2-3) Prereq Bot 120 or Bio S 104; Chem 240. Weed science; weed identification, biology and control; herbicides and factors influencing their use.
410 Seed Production and Technology 1(0-3) Prereq Bio S 104 or Bot 120; Bot 320. Principles of seed production, physiology and quality evaluation. Field trip required.
519 Physiology of Flowering 2 (Idaho) drop
569 Applied Seed Physiology 2(1-3) Prereq Bot 320. Impact of physiological and environmental factors on seed germination, vigor and establishment of commercially important crop species. (ay) Cooperative course taught at the University of Idaho (PISC ID559).

Alcohol Studies

Acs5—new prefix
365 Problems of Alcohol Addiction and Abuse new 3 Same at Psych 365.
366 Treatment Approaches in Alcohol Abuse/Alcoholism 3 Same as Psych 366.
367 Special Topics in Alcoholism 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Acs5 365, 366. By interview only. Selected current topics in alcoholism and alcohol-related problems.
444 Basic Helping Skills 2(0-6) Same as Psych 444.
447 The Practice of Alcoholism Counseling 2 new Prereq completion of Acs5 minor. By interview only. Rules and regulations governing alcoholism facilities; professional, ethical, and legal issues; work with other professionals, agencies, and the community.
499 Special Problems V 1-4 May be repeated for credit.
Alcohol Studies, minor in (16 hour minimum) Acs5 365, 566; Phar 217; Acs5/Psych 444 or S W 493; Psych 321 or 333; S W 394 or 494 or Psych 440. Recommended electives: Acs5 367; Psych 220, 234, 550; Soc 504; S W 190, 353.

Animal Sciences

A S
313 Feeds and Feeding 4(3-3) Prereq Bio S 102 or 104. Utilization, practices, requirements, nutritive characteristics and calculations of rations for animals. Credit not granted for both A S 213 and 313.
314 (301)Principles of Nutrition 3 Prereq Bio S 104; Chem 102 or 106; Chem 111 or 240. Digestion, absorption, metabolism, and functions of nutrients.

Anthropology

Anh
300 Field Methods V 2-8 By interview only. Practice in methods of archaeological, ethnological or linguistic field research. (SS)
405/505 Anthropology and Education 3 drop
419 Cultural Components of International Business new 3 Introduction to culture in international business.
435/535 Cultural Resource Management 3 Role of archaeology in historic preservation and resource conservation; legal and institutional frameworks; research in a management context. Credit not granted for both Anth 435 and 535.
462/562 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. Credit not granted for both Anth 462 and 562.
500 Field School V 2-4 Training in gathering and analyzing field data. (SS)
502 Cross-Cultural Gender and Kinship 3 Graduate level counterpart of Anth 402; additional requirements. Credit not granted for both Anth 402 and 502.
504 Tribal Peoples and Development 3 Global and historic perspectives on the complete issues surrounding the problem of tribal peoples and development.
Biochemistry and Biophysics

BC/BP
587 Advanced Topics in Plant Biochemistry 2
New Prereq BC/BP 563, 564; basic botany. Biochemistry unique to plants; new research advances. (ay)

Biometrics (see Program in Statistics)

Black Studies

BI St
250 Food and Cultures of African Peoples 3
Drop
301 Spoken Swahili I 4
Drop
302 Spoken Swahili II 4
Drop
325 Women and Minorities in the Economy 3
Drop
370 Topics in Black Studies 3 Contemporary social, economic, political, and historical issues which affect the life and experience of Blacks in the U.S. (ay)
410 Ethnic Groups and Public Education 2 or 3
Drop
454 Black Family in America 3 Sociological examination of black family in America from slavery to the present.
474 African Politics 3 Historical, economic, and social factors that shape contemporary African political systems and problems of nation-building.
498 Seminar in Black Studies Theory and Writing Methods 2 Prereq BI St 101. Analysis and discussion of readings in Black Studies; research and writing methods.

Botany

Bot
120 [B] Introduction to Botany 4 (3-3) Survey of the plant kingdom; structure and function of vascular plants.
421 General Mycology 4 (2-6) Same as PL P 421. (ay)
429 (329) General Plant Pathology 3 (2-3) Same as PL P 429.
436/536 Agrostology 3 (1-6) Prereq Bot 332. Classification and identification of grasses and grass-like plants. Credit not granted for both Bot 436 and 536.
507 Electron Microscopy Laboratory 3 (0-9) New Same as Zool 507. (ay)
556 Physiology 4 (3-3) Prereq Micro 201. Biology of the algae; systematic, morphology, physiology, cytology, and ecology of algae with emphasis on freshwater forms. (ay)

Business Law

B Law
210 Law and the Legal Environment of Business 3 Not open to freshmen. Fundamentals of business law; the legal system, legal reasoning and the law of contracts, torts, and agency.
240 Law and Government Regulation of Business 3 Prereq B Law 210. Legal aspects of government regulation of business; administrative law, antitrust law, and labor law.
411 Law of Business Organizations 3 Prereq B Law 210. Law of partnerships, corporations, securities regulation, secured transactions and bankruptcy; needed by CPA candidates.
415 Law of International Trade 3 Prereq B Law 210. Legal organization of the international community; international aspects of trade and development, economic cooperation, and technical, social, and cultural cooperation.
510 Law for the Business Manager 3 Contract, tort, constitutional and administrative law; impact of government regulation on business.

Chemical Engineering

Ch E
451 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.
522 Viscous Fluid Flow V 1-3
Drop
545 Mass Transfer Operation I 2-3
Drop
560 Biochemical Engineering V 2-3 Applications of chemical engineering to biological systems; fermentation processes, biochemical reactor design, transport phenomena in biological systems, biochemical technology. Joint listing with the University of Idaho (ChE ID560).

Chemical Physics

Ch P
510 Solid State Direct Energy Conversion 3
Drop
517 Electrical, Magnetic, Optical, and Conductive Properties of Solids 3 (EE)

Chemistry

Chem
101 [P] Chemistry Related to Everyday Life I 4 (3-3) Prereq satisfactory Chem placement test score. Chemical phenomena important to humans and their environment; basic chemical concepts with applications to consumer products, technology, and life processes.
106 [P] Principles of Chemistry 3 Prereq Chem 105 or 115. Acid, basic, ionic, molecular, solubility, and redox equilibria; bonding, electrochemistry; coordination, compounds; systematic chemistry of the elements.
107 Qualitative Analysis 2 (0-6) Prereq Chem 106 or chl. Qualitative analysis; identification of various cations and anions.
Chicano Studies

Ch St 220 Mexican Art History 3 drop
324 Spanish for Spanish Speakers I 3 Same as Span 324
325 Spanish for Spanish Speakers II Preq Span 324; fluency in Spanish. Readings of Mexican, Latin American, and Peninsular writers; muralism and modern art; composition, grammar, subjective and imperative moods, style.
332 Chicano Art Seminar 3 drop
375 Chicano/Latino Politics 3 Character, role, and goals of Chicano/Latino politics; contemporary Chicano/Latino issues.
382 Sociology of Chicanos 3 drop
410 Ethnic Groups and Public Education 2 or 3 drop

Child and Family Studies

CFS 240 Human Development I 3 Preq Soc 101 or Psych 101. Major theories of human development; important factors in development and guidance of children from birth into adolescence.
247 Introduction to Family Studies 3 Preq Psych 101 or 102 or 105 or Soc 101. Basic dimensions and concepts of the family system; interaction between family members and with other external systems.
342 Curriculum for Young Children's Programs 3 Preq CFS 240; c/l in CFS 343 for CFS majors. Curriculum theory, development, implementation, and evaluation for early childhood programs for children ages 0-10 years.
343 Young Children's Program Lab 1(0-3) new Preq c/l in CFS 342. For CFS majors.
403 Professional Perspectives 3 Same as AgHE new 403.
420 Adolescent and Early Adult Development new 3 Preq CFS 240. Theories and concepts of individual development in adolescence and early adulthood.
440/540 Theories of Human Development 3 Preq CFS 240, 247. Theories of human development and application to programs for children and families. Credit not granted for both CFS 440 and 540.
447 Families in Crises 3 Preq CFS 247, 450; S W 395. Crises in family life; range of interventional techniques for helping families.
450 Management Experiences with Families 3(1-0) Preq CFS 350. Integration and application of management principles and processes concerning individuals, families, and community service agencies.
497 Field Experience Preparation 1 May be repeated for credit; cumulative maximum 2 hours. Preq CFS 350 or c/l. Preparation for field placement; career planning, resume preparation; placement opportunities; planning, and skills.
498 Field Experience V 1 & 2 May be repeated for credit; cumulative maximum 8 hours. By interview only. Preq CFS 450, 497. Supervised individual experiences with related businesses, organizations, or government agencies.
503 Early Childhood Education 3 (Idaho) drop
542 Research Methods in Child and Family Studies 3 Preq 6 hrs child development. Methodologies in research on child and family issues; applications to current problems.
563 Seminar in Developmental Research Topics 3 drop

Child and Family Studies, Options in Child Development and Human Services

Departmental Core: CFS 240, 242, 247, 320, 350, 442, 447, 450, 496, Engl 101; Econ 102; FSHN 130; ID 202; Psych 102, 285 or Soc 320; Soc 101.

Child Development Option: completion of departmental core and one emphasis below plus CFS 342, 343, 440, 448; Sp Ed 301.

(1) Preschool Education emphasis: CFS 446, 449 (2 hrs); Drama 364; Mus 388 or 390; Psych 361, 464 or 473; Spe 371; Sp Ed 499; S W 390 or 395.

(2) Child Development emphasis: GenCB 201; CFS 446, 449; Psych 311, 361; Soc 350, 450; Sp Ed 409; S W 395; Zoology 251 or Sp 372.

Human Services Option: completion of departmental core and one emphasis below plus CFS 352, 353, 454; Econ 205.

(1) Family Studies emphasis: CFS 342, 343, 420, 440, 448; Pol 311 or 306; S W 395 and 3 additional hrs S W.

(2) Consumer Studies emphasis: CFS 454; B Law 210; Econ 301, 312 or 320 or 340 or 350; Mktg 350, 367; Pol 311, 318 or 450.

(3) Child Life emphasis: Bio 302; CFS 342, 343, 344, 420, 440, 446, 448, 449 (2 hrs), 499 (2 hrs); Mus 388 or 390; Phil 260 or 365; RLS 460; Soc 446; SpCom 235; Spe 371 or Drama 364; Sp Ed 301; Psych 321, 333 or 464.

Civil Engineering

C E 212 Dynamics 3 Preq C E 211. Kinematics and kinetics of particles and rigid bodies; introduction to mechanical vibration. Joint listing with the University of Idaho (ES 322, 220).
304 Land Surveying 2 (Idaho) drop
422 Pavement Design 3 drop
424 Transportation Engineering and Planning 3 drop
425 Planning for Civil Engineers 3 drop
503 Advanced Topics in Construction Engineering V 2 & 4 May be repeated for credit; cumulative maximum 9 hours. Preq C E 464; Math 360. Analysis, planning, design, and evaluation of construction engineering and management.
513 Stability of Structures 3 Elastic and inelastic buckling phenomena of bars, beams, frames, and plates.
546 Water Quality Management 3 drop
555 Advanced Hydraulic Design 3 (2-3) Preq C E 315. Dams, spillways, and outlet works; design of a major structure. Cooperative course taught at the University of Idaho (CE ID555).
556 Natural Channel Flow 3 Hydraulics of non-uniform flow in irregular channels; unsteady flow; routing and density currents. Cooperative course taught at the University of Idaho (Hydro ID572).
579 new Groundwater Management 3 Preq Geol/C E 475. Hydrologic, economic, and legal factors controlling development and management of groundwater resources. Cooperative course taught at the University of Idaho (Hydro ID572).

Classics

Clas 299 Latin Readings and Conferences V 1-4 May be repeated for credit. Preq Clas 102.
351 H J Classical Literature 3 Greek and Latin classics in English translation: reading, discussion, classroom essays, lecture.

Clothing, Interior Design and Textiles

C T 218 Apparel Analysis 3 (2-3) Preq C T 101; new C T 215 or c/l. Organization and mechanics of commercial apparel production; construction methods, sizing, styling, and fit of commercially produced garments; fashion terminology.
318 Merchandising I 3 (2-3) Preq C T 108, new 217, 218, Mktg 360 or c/l. Application of planning and buying principles to merchandising.
377 new Visual Merchandising 2 (1-3) drop
403 Professional Perspectives 3 Same as AgHE new 403.
414 Advanced Weaving 3 (1-6) Systems used for designing and recording designs for loom-controlled fabric structures. Cooperative course taught at the University of Idaho. (HCC ID414).
416 Designing for the Loom 3 (1-6) Preq new C T 314. Design possibilities unique to woven textiles. Cooperative course taught at the University of Idaho. (HCC ID416).
418 Fashion Theory 3 drop
418 Merchandising II 3 Preq C T 318, Mgt new 301. Management principles as related to the buying and selling of textiles and apparel products and the supervision of personnel.
Computer Science

Cpt S 105 Computer Software in Business 4 Computer software applications in business planning, management, and development; elementary computer architecture; computer selection and configuration.

150 Program Design and Development 4 Prereq Math 107. Formulation of problems and top-down design of programs in a modern structured language for their solution on a digital computer.

151 FORTRAN Programming 2 Comprehensive programming practice using FORTRAN.

153 BASIC Programming 2 Comprehensive programming practice using BASIC.

154 PASCAL Programming Laboratory 2 drop

240 Programming Language V 1-3 May be repeated for credit; cumulative maximum 5 hours. Prereq Cpt S 150; Cpt S major. Advanced concepts of languages learned in 150, 151, 155 or a different programming language.

250 Advanced Programming 3 Prereq Cpt S 150. Advanced programming techniques: data structures and program design principles; nonnumeric computing.

260 Computer Organization and Programming 3 (2-3) Prereq Cpt S 150. Organization of digital computers; concepts and examples in machine and assembly language programming; laboratory experience with a small computer.

316 Discrete Structures 3 Prereq Cpt S 150 or 151; Math 220. Introduction to and applications of set theory, discrete structures, elementary logic, and combinatorics.

330 Numerical Computing 3 Prereq Cpt S 150 or 151; Math 172. Design and implementation of various numerical algorithms in FORTRAN; use of library routines in solving numerical problems.

370 Systems Analysis and Design 3 Prereq Cpt S 150 or 241. Analysis and design of computer-based systems typically found in a business environment; related programming.

435 Computer Methods in Probability and Statistics 3 Prereq Cpt S 150 or 151. By interview only. Extensive use of computers to generate random variables to illustrate, develop, and expand results in probability/statistics.

445 Digital Image Processing 3 Prereq Math 275; Cpt S 250 or 203. Digitization, coding, enhancement, restoration, reconstruction, segmentation, and description of digital images.

490 Work-Study Internship V 3-9 May be repeated for credit; cumulative maximum 9 hours. Prereq Cpt S 150, 151, 153, or 241; 250, 260; 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.

495 Consulting in Computer Programming 1 May be repeated for credit; cumulative maximum 2 hours. Prereq Cpt S major;
only. Recent developments in counseling psychology research and design applied to PhD dissertation proposals.

593 Group Counseling 3 Prereq CoPs 512, 518, 535. 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 CoPs 518, 593. By interview only. Supervised experience.

597 Counseling Psychology Internship V 5-10 May be repeated for credit; cumulative maximum 20 hours. Prereq passing of prelims and completion of coursework for Ph D Counseling in APA approved internship.

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.

Criminal Justice

Crm J 375 The Philosopher and the Humanist: Their drop Impact on the Criminal Justice System 3.

535 Planned Change in Criminal Justice 3 new Analysis of change efforts aimed at individuals, organizations, and communities to reduce crime and improve the criminal justice system.

Drama

Drama 465 Historic Costume for the Stage 3 drop

566 The Theory of Drama 3 drop

568 Seminar in Theatre 3 drop

Economics

Econ 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. Credit not granted for both Econ 301 and 302.

302 Intermediate Microeconomic Theory 3 Prereq Econ 203 or 201, Math 171 or 202. Microeconomic theory using calculus. For majors in Econ and Ag Ec. Credit not granted for both Econ 301 and 302.

325 Women and Minorities in the Economy 3 drop

410 Elements of Mathematical Economics 3 Prereq Econ 301 or 302, Math 273. Introduction to mathematical optimization in economic theory.

445 Economic and Business Fluctuations 3 drop

464 Freight Transportation Economics 3 Prereq Econ 301 or 302, 311, 364. Analysis of market structure, conduct, and performance of the intercity freight transportation industry using micro theory and basic econometrics. (ny)

468 Public Utility Economics 3 drop

564 Transportation and Urban Economic Analysis 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 501, 511. Advanced freight transportation; cost, production, demand and network analysis; urban transportation models and related issues.

579 Practicum in Teaching and Education 1 May be repeated for credit; cumulative maximum 4 hours. Problems and issues encountered in college teaching.

590 Seminar in Curriculum and Instruction V 3-6 Prereq teaching experience. Contemporaries, issues, and designs in educational programs.

new Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Prereq teaching experience. Recent research, developments, issues, and applications in selected areas of education.

525 Foundations of Community Education 3 History, purposes, basic concepts underlying contemporary community education programs.

526 Education Resources for Community Problem Solving 3 Identifying community needs and resources, facilitating interagency cooperation, organizing the community education program.

536 Qualitative Research in Education 3 new Theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.

560 Student Personnel Services in Higher Education 2 or 3 Prereq EdPsy 435. Philosophy, structure, functions, and organization of student personnel services.

570 The Community and Junior College 3 For teachers and administrators, development and function of the junior college community.

571 Undergraduate and Community College Teaching 3 Prereq Ed 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 Social Foundations of Education 3 Educational adaptations to the economic and social needs and forces.

510 Improvement of Instruction 3 Prereq teaching experience. Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.


514 Basic Principles of Curriculum Design 3 Prereq teaching experience. The application of theoretical concepts and approaches in the planning and design of curricula.

516 Curriculum Implementation 3 Prereq teaching experience. Research and practice; innovation and change in curricular organization emphasizing implementation. 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, specialized personnel, principals, and superintendents with responsibility for in-service programs; practices and procedures in in-service education.

518 Educational Technology 3 Prereq Elc 445 or 446. Relates research and theory of communication to instructional resources and current educational technology; problems of planning and administering programs.

582 Policy Formation in Education 3 Prereq Ed 580. Policy formation and political aspects of education; collective bargaining, voter behavior, bonds, ballots, resolutions of conflicts.

583 Community Relations in Education 2 or 3 Social, political, and economic relation-
ships between education and the community; methods of public polling and campaign strategy techniques.

584 Personnel Relationships in Public Schools 2 or 3 Prereq Ed Ad 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. Joint listing with the University of Idaho (Ed 1505).

586 Management of Facility Planning 3 Principles and procedures in the development of educational specifications, conducting needs assessment, forecasting, selecting an architect.

587 Seminar in School Administration V 1-6 May be repeated for credit; credit/peer maximum 6 hours. Prereq 6 hrs graduate work in administration. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 Parsons 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 V 2-3 Improving knowledge and skills in planning systems, decision making, leadership, conflicts, motivation, staff development, productivity, stress.

590 Internship V 3 or 6 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals. (SS)

597 Special Projects or Independent Study Variable credit.

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

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

Educational Psychology (was Education)

EdPsy 301 Educational Psychology 4 Prereq Psych 102, Ed/Se 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.

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.

401 Evaluation of Learning, Elementary 2 Prereq Ed/Se 305 or 320. Theory and methods of evaluating pupil progress in the elementary schools.


434/435 Introduction to Guidance 2 or 3

Prereq 12 hrs Educ. Guidance; history, philosophy and services. Credit not granted for both EdPsy 434/435 and 534/535.

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.

490 Instructional Practicum V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

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

502 Advanced Educational Psychology 3 Prereq EdPsy 301. The interpretation of fundamental psychological facts, theories, and principles applying to education.

505 Research Methods 1 3 Research methods; literature review, design, implementation, and interpretation of results.

508 Educational Measurement 3 Prereq EdPsy 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 EdPsy 508. Theory and use of standardized educational measurement devices; intelligence, aptitude, and achievement tests.

519 Practicum in College Instruction 1-0-3 May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised experience in college teaching.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Prereq teaching experience. Recent research, developments, issues, and applications in selected areas of education.

555 Education of the Gifted and Talented 2 or 3 Prereq 9 hrs Educ. Provisions for the identification, education, and counseling of gifted and talented persons, preschool through adolescence.


566 Attitude Scaling Techniques 3 Prereq EdPsy 509. Theory of scaling; development of techniques for appraising attitudes, interests, and appreciation.

567 Program Evaluation 3 Prereq EdPsy 509. Strategies and techniques for evaluation of educational programs.

568 Research Methods II 3 Prereq EdPsy 505, 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.

569 Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq EdPsy 565. Application of parametric and non-parametric statistics, data processing using computer packages in educational 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.

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

Electrical Engineering

EE 214 Design of Logic Circuits 3 (2-3) Prereq Math 172 or c/l. Functional approach to design of electronic logic circuits; exposure to elementary circuit concepts and design with integrated circuits.

324 Design of Computer Systems 4 (3-3) Prereq EE 314. Strategies and implementation for system operations, memory management, I/O interfacing in medium and large computers.

352 E E Laboratory 3 (1-2) Prereq EE 311, 321, or c/l; Cpt S 150 or 151 or 203; major in E E or Cpt E. Experiments in electrical circuits, measurements and electronics; principles of measurements and measuring instruments.

414 Fundamentals of Digital Systems 3 Prereq EE 214 and Cpt S 260; or EE 314; major in E E. Boolean algebra; minimization of Boolean functions; realization of combinational and sequential logic circuits; digital system organization and design.


474 Digital Image Processing 3 Same as Cpt S 445.

476 Electronic Circuits 3 Prereq EE 311, 351 or c/l; EE 489 or c/l; c/l in EE 477. Circuits with active elements; design of amplifiers, oscillators, and other circuits using semiconductors.

486 Power Electronics 3 Prereq EE 311, 314, 361. High power electronics devices; theory, limitations, and applications; analysis and design of sources, motor controllers, and switching circuits. Joint listing with the University of Idaho (EE 1525).

501 Linear System Theory 3 Prereq EE 489. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems. Joint listing with the University of Idaho (EE 1572).

509 Electric Machine Theory 3

512 Active Network Synthesis 3 (Idaho)

516 Microwave and Optical Communication Systems 3 Prereq EE 351. Electromagnetic propagation in inhomogeneous and anisotropic media; rays and modes; dispersion; terrestrial microwave, satellite, microwave and optical fiber communications.
524 Microprocessor Design 3 Prereq E E 424.

527 Antenna Theory and Design 3 Prereq E E 351. Antenna fundamentals, analytical techniques, characteristics and design procedures for selected types of wire, broadband, and aperture antennas.

534 High Performance Computing 3 Prereq E E 414. Development, current state and future high performance computing; application of existing commercial supercomputers to engineering problems. Cooperative course taught at the University of Idaho (EE 1D504).


586 VLSI Systems Design 3 Prereq E E 444. VLSI models, layout algorithms, design methodologies, simulation and layout tools, algorithm design for VLSI implementation.

Elementary and Secondary Education (was Education)

El/Se 100 Reading Efficiency and Study Skills 1 (0-3) Strategies to augment such student capabilities as vocabulary, comprehension, rate flexibility, note-taking, test-taking, and study skills.

101 Reading Efficiency and Study Skills 1 new Strategies to augment such student capabilities as vocabulary, comprehension, rate flexibility, note-taking, test-taking, and study skills.

300 Introductory Field Experience 1 (0-3) Supervised field experience for preservice teachers designated as an orientation to educational setting of the school.

303 Teaching in Secondary Schools 4 (3-3) Prereq El/Se 300, 301. Materials and general methods for teachers; observation to be scheduled in 3-hour block once a week.

304 Elementary Mathematics, Science, Social Studies I 3 Prereq El/Se 300, EdPsy 301, Math 300 or c/l. Scope and sequence of content in elementary and middle school science, social studies, and mathematics.


306 Survey of Elementary Reading and Language Arts 4 Prereq EdPsy 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 Prereq EdPsy 301 or c/l. For preservice elementary teachers. Improving writing skills; preparing effective writing lessons.

310 Reading Materials for Adolescents 3 drop

311 Teaching Elementary Physical Sciences 3 new (2-3) Prereq EdPsy 301; Math 200. Science teaching techniques, processes, and materials appropriate for selected physics and astronomy experiences in elementary schools.

312 Teaching Elementary Astronomy-Geology Sciences 3 (2-3) Prereq EdPsy 301, Math 200. Science teaching techniques, processes, and materials appropriate for selected earth sciences and astronomy experiences in elementary schools.


329 Seminar in Contrastive Linguistics 3 drop

335 Bilingual Cross-Cultural Education 3 Same as Ch St 335.

389 Art Media for Schools 3 (0-0) Same as F A 389.

390 Elementary School Art Education 2 (1-3) Prereq EdPsy 301. Creative methods for utilizing art media in the elementary classroom.

403/404 Social Foundations of Curriculum 3 Prereq El/Se 303 or 320; c/l in directed teaching. Public school curriculum.

405/406 Directed Teaching V 8 (1-21) to (12-33) May be repeated for credit. Prereq El/Se 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.

410 Ethnic Groups and Public Education 2 or 3 drop

411 Bilingual Methods and Materials Across Content Area 3 Prereq El/Se/Ch St 335. Approaches, methods, and materials across content areas for the bilingual classroom.

430/431 Innovations in Reading 2 Prereq El/Se 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 El/Se 450/451 and 530/531.

432/433 Children's Literature in the Curriculum 2 Prereq El/Se 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 El/Se 432/433 and 532/533.

445/446 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.

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.

450/451 Teaching Reading in Middle and Secondary Schools 2 or 3 Prereq EdPsy 301. Theory and practice of teaching content area, developmental and remedial reading; staff development and practical applications, grades 6-12.

452 Content Area Reading and Study Skills Practicum V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq El/Se 320 or 450. Development and delivery of vocabulary, comprehension, and study skills under supervision of Reading Coordinator.

455 Educational Uses of Microcomputers 2 or 3 Prereq El/Se 305 or 304. Types and functions of educational software, evaluation criteria, designing instructional programs and classroom considerations.

462/463 Corrective Reading in the Classroom 2 Prereq El/Se 320. Investigation, formulation, application of informal and formal assessment for classroom grouping and instruction; specific skills needed of learning-delayed readers.

485/486 Social Studies in the Contemporary School 2 Prereq junior standing and Bases, scope, and sequence of the social studies curriculum; problem analysis of timely issues.

490 Instructional Practicum V 1 (0-3) to 5 (9-0) May be repeated for credit; cumulative maximum 8 hours.

491 Education and Social Change in Africa 3 Same as Bl St 491.

492 Designing Art Programs for the Public Schools 3 Prereq El/Se 390, secondary art major, or teaching experience. Preparation of preservice and in-service educators in the development of arts programs (K-12) responsive to current needs and trends.

497 Topics in In-Service Education V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.

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

511 Teaching Poetry to Children and Young People 3 drop

513 Seminar in Middle School Education 3 Prereq teaching experience. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

519 Practicum in Teaching and Education 1 May be repeated for credit; cumulative maximum 4 hours. Problems and issues encountered in college teaching.

521 Topics in Education V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and applications in selected areas of education.

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. (SS)

529 Psycholinguistics for Reading Centers 3 Use of reading/learning centers in the common schools (K-12) and design of reading activities from psycholinguistic research perspectives. (SS)

530 Innovations in Reading 2 Graduate level counterpart of El/Se 430; additional requirements. Credit not granted for both El/Se 430 and 530.
Innovations in Reading 2 Same as ESL 350. Graduate level counterpart of ESL 453; additional requirements. Credit not granted for both ESL 453 and 531.

Children's Literature in the Curriculum 2 Graduate level counterpart of ESL 452; additional requirements. Credit not granted for both ESL 452 and 532.

Children's Literature in the Curriculum 2 Same as ESL 532. Graduate level counterpart of ESL 453; additional requirements. Credit not granted for both ESL 453 and 533.

Innovations in Language Arts 3 Prereq ESL 305 or 320 or teaching experience. The most recent developments in language arts instruction for in-service teachers, K-12 (from summer only to regular semesters).

Elementary School Social Studies 3 Prereq teaching experience. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

Elementary School Science 3 Prereq ESL 305 or teaching experience. Theories and research underlying modern science programs with classroom implications.

Elementary Mathematics 3 Prereq ESL 305; Math 105; teaching experience. Classroom experiences and materials for helping children understand number properties and operations; research findings related in instruction.

Advanced Children's Literature 3 Prereq ESL 307; teaching experience. Trends, issues, and research in children's literature.

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)

Teaching Written Expression in Elementary School 3 Prereq teaching experience. Research on children's written language development; application to elementary school classroom.

Teaching Folk Literature to Children and Adolescents 3 Prereq ESL 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. (SS)

Early Childhood Language Arts 3 (2-3) drop

Research in Reading 2 or 3 Prereq ESL 320; teaching experience. Research applied to pertinent classroom problems in the teaching of reading.

Psychology of Reading 2 Prereq ESL 320 or 450/451; teaching experience. Psychological, perceptual, motivational, developmental and physiological aspects of reading. (a/y)

College Reading Practicum V 1 (O-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq ESL 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.

Diagnosis and Treatment of Reading Disability 4 (3-5) Prereq ESL 320. Remedial techniques for experienced teachers, remedial reading teachers, and reading consultants; causes of disability, testing, diagnosis, an remediation; tutoring.

Approaches to Reading Instruction 3 Prereq ESL 320 or teaching experience. Approaches to teaching elementary school reading; theoretical bases, materials, evaluation, implementation strategies. (SS)

Internship V 3 or 6 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional position.

Special Projects or Independent Study Variable credit. (a/y)

Master's Research, Thesis, and/or Examination Variable credit. (a/y)

Master's Special Problems, Directed Study, and/or Examination Variable credit. (a/y)

Doctoral Research, Dissertation, and/or Examination Variable credit. (a/y)

Engineering—Bachelor of Science degree in Engineering dropped.

Engineering Management—new course prefix E M (Spokane, Vancouver only)

Project Management 3 Prereq basic stat. new Project organization and planning; scheduling techniques; project control; optimization techniques; project administration. (off campus only)

Advanced Topics in Engineering Management V 1-3 May be repeated for credit; cumulative maximum 6 hours. Engineering economy, decision theory, personnel management, organization theory, computers, marketing, productivity, information systems, communications, public policy. (off campus only)

Special Projects or Independent Study new Variable credit. (off campus only)

Master's Special Problems, Directed new Study, and/or Examination Variable credit. (off campus only)

English

Engr 200 [W] Expository Writing V 1-2 By interview new

Engr 403 [W] Professional and Technical Writing—EES 3 Technical writing techniques, formal report preparation; focus on special grammatical and rhetorical problems of EES students.

Seminar in American Studies 3 Credit not new granted for both Engr 413 and 513.

Seminar in the Teaching of Writing: Methodology of Composition Development of a workable definition of the methods of composing through a review of relevant research and problem-solving exercises.

Seminar in the Teaching of Writing: Contemporary theories of composition and their application to the classroom.

Seminar in Diagnosis and Evaluation of Writing 3 Problems involved in the diagnosis and assessment of student writing.

Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of Engr 443; additional requirements. Credit not granted for both Engr 443 and 543. Joint listing with the University of Idaho (Eng ID 510).

Entomology

Entom 441 Insect Taxonomy 4 (2-6) Prereq Entom 340 or 543. Identification of insect orders and families; basic principles of taxonomic entomology; collection and preparation of adult insects for study. (a/y)

(540) Taxonomy of Immature Insects 4 (2-6) Prereq Entom 343. Identification of eggs, larvae, nymphs, and pupal stages of insects; collection and preparation of immature insects. (a/y)

(544) Insect Morphology 4 (2-6) Prereq Entom 340 or 343. Comparative external morphology and internal anatomy of insects. (a/y)

(545) Acarology 3 Prereq Entom 441. Identification, biology, and ecology of free-living and parasitic mites. (a/y)

(545) Toxicology of Pesticides 3 Prereq Chem 240, Zool 222, or Entom 340 or 343. General principles of pesticide toxicology; classification, mode of action and metabolism of each group of farm pesticide chemicals. (a/y)

Entomology, Minor (minimum 16 hours)

Entom 343, 441, or 442 and 9 hrs from: Entom 348, 443, 444, 448, 450, 452, 480, IPM 201, 452, 462

Environmental Science

Env S 402 Earth's Resources 3 Same as Geol 402, drop

12 Forest and Range Policy and Administration 3 Same as FRM 412

480 Advanced Resource Economics 3 Same as new AgEc 480

550 Legal Process 3 Law and legal processes as they relate to resource decisions, management, development, and preservation. Cooperative course taught at the University of Idaho (Law ID 511).

560 Watershed Management 3 Same as FRM new 560.

Finance, Department of—(two Finance & Marketing)

Fine Arts

FA 204 Mexican Art History 3 drop

205 Native American Arts 3 drop

Food Science and Human Nutrition

FSHN 403 Professional Perspectives 3 Same as AgHE new 403.
Forestry and Range Management

FRM
312 Forest Mensuration 4 (3-3)
drop
313 Forest Measurements 2 (1-3) Prereq Math 140, 171, or 202. Theory and application of forest measurements.
321 Introduction to Wood Technology 3 (2-3) Prereq Bio S 105. Anatomy of woody plants, identifying characteristics, and properties of woods; relation of wood properties to processing and use. Field trips required. Cooperative course taught at the University of Idaho (ForPr ID 331).
351 Principles of Range Management 3 Range science principles and management; range history, multiple use, ecology, physiology of range productivity and utilization; grazing management; range improvement.
400 Professional Development I 1 Prereq FRM 300. Integration of summer professional experience (from S, F grading to regular letter grading).
414 Forest Sampling 2 Prereq Cpt S 150, 151, or 153; FRM 204, 312; Stat 310 or QMeth 215. Forest sampling and cruising; sampling designs and estimating techniques needed in stand management.
418/518 Forest Growth and Yield 2 (1-3) new Prereq FRM 312, 314; Stat 310 or QMeth 215; Math 140, 171, or 202; Cpt S 150, 151, or 153. Factors influencing forest yields, traditional prediction methods; development and application of growth and yield simulators. Credit not granted for both FRM 418 and 518.
451 Range Habitat Analysis 4 (2-6) Prereq Stat 310; Cpt S 150. Measurement and evaluation of range condition and trend for range livestock use and big game habitat; computer technology applied. Field trip required.
480/580 Big Game Range Management 3 Prereq FRM 301; 330. Big game habitat management on rangelands and forested ranges; big game habitat rehabilitation. Credit not granted for both FRM 480 and 580.
512 Economics of Timber Demand and Supply 2 Prereq FRM 511. Economic analysis of factors affecting demand for and supply of public and private timber and related forest products. (a/y)
543 Population Management 3 (1-3) drop
544 Population Management 2 (1-3) drop
561 Wildland Environmental Analysis 2 (1-3) drop
581 Large Herbivore Interrelations 2 (1-3) Prereq 9 hrs upper-division animal science, range or wildlife management. Social and exploitive competition and other interactions among range livestock and big game; common-use grazing system modeling; quantitative methods.

French

Fren
315 French Civilization—Early Period 3 Readings, lectures, and discussions in English. Cultural and social trends in France from ancient times to 1715.
316 French Civilization—Modern Period 3 Readings, lectures, and discussions in English. Cultural and social trends in France from 1715 to the present.
330 Advanced Intensive French for Undergraduates 6 (3-9) (SS)
530 Advanced Intensive French for Graduate Students 6 (3-9) (SS)
551 Seminar in 20th Century French Literature 3

General Agriculture and Home Economics (See Adult and Youth Education)

GenCB
490 Instructional Practicum V 1-3 drop
542 Induced Mutation 3 drop
550 Advanced Cell Biology 3 Prereq GenCB 450. Cell structure and movement, organelle structure and genome, and cell signal processing.

German

Ger
103 Guten Tag I 1 (0-2)
drop
104 Guten Tag II 1 (0-2)
drop
315 German Civilization 3 The cultural development of the German peoples to 1750. Readings, lectures, and discussions in English. (a/y)
316 German Culture and Civilization 3 The cultural development of Germany from 1750 to the present. Readings, lectures, and discussions in English.
317 Contemporary Culture and Society I Readings and lectures in English. Current social, political, economic, and cultural trends in Germany. (a/y)
460 German Poetry 3

History

Hist
208 American Indians to 1830 3 Same as Na Am 208.
209 American Indians from 1830 3 Same as Na Am 209.
308 [K] North American Indian History, new Prehistory to Present 3 History of North American Indian peoples from circa 1350 to the present.
352 Gandhi and Twentieth Century India 3 Same as For L 352.
373 [G] Chinese Civilization 3 Growth of Chinese civilization from the dawn of history to the present.
439 Seminar in Latin American History 3 drop
455/555 From the Tudor Revolution to the Glorious Revolution 3 England in the age of the Protestant Reformation; from the Tudors to the victory over James II; culture and politics.
456/556 Stuart England 3 drop
485/585 Inter-American Relations 3 Same as Pol S 414/514.
538 Seminar in Latin American History 3 drop
542 Seminar in Renaissance/Reformation 3 drop
Horticultural Research Techniques 1 drop

**Horticulture, minor in**
A minimum of 16 hours in Horticulture is required of which at least 8 hours must be in upper-division courses excluding Hort 399, 456, and 499. Hort 201 is required; Hort 251 is recommended.

**Hotel Administration**
H A

311 Law in Inkeeping 1 drop

580 Hospitality Services Marketing 3 Prereq new Mktg 505. Services marketing concepts and principles applied to hospitality organizations; strategies to market services and control quality.

581 Hospitality Services Management 3 Prereq new Mgt 501. Design and management of service systems in hospitality operations; control of customer interaction, personnel activities and inventory.

**Humanities**
Hum

105 (100) [H] Mythology 3 Theory of human behavior and expression in myth and symbols. [H] Gracco-Roman and one other.

204 [H] Reason, Romanticism, and Revolution 3 Integrated humanities; literature, philosophy, history, art, and music of the Modern World.

301 Greek and Roman Drama 2 drop

**Insurance**
Ins

321 (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.

**Interior Design**
I D

201 Perception and Communication 3 (0-0) Prereq I D 101 or c/l. Theoretical concepts relating to design objects and elements explored through various design and communication media.

211 History of Design I 2 Design forms from prehistoric periods to the Renaissance period.

212 History of Design II 2 Prereq I D 211. Interiors and furnishings from the Renaissance period to the Industrial Revolution.

311 History of Design III 2 Interiors and furnishings from the Industrial Revolution through the 20th century.

325 Lighting for Interiors 3 (2-3) Analysis, planning, production, and visual applications of interior lighting; artificial lighting sources.

**Japanese**
Jap

505 Intermediate Japanese 5 (SS) drop

**Journalism**
Jour

425 Reporting of Public Affairs 3 Prereq Jour 305. For seniors and graduate students.

**Landscape Architecture**
L A

262 Landscape Architectural Design I 3 (2-2) Prereq Arch 101, 102. Basic design and graphic techniques related to solving elementary design problems.

290 Professional Work Experience. Contracting and Maintenance V 1-4 Prereq major in Pre-LA or L A. Planned and supervised professional work experience in landscape contracting and/or landscape maintenance.

361 Landscape Architectural Design III 4 (1-9) Prereq L A 263. Professional design and planning problems, residential, urban, regional, and open space issues.

362 Plants and Landscape Architectural Design IV 4 (2-4) Prereq Junior in L A; Hort 332. Design projects; use of plant materials to support design objectives.
solve spatial, horticultural, biological, aesthetic, and environmental problems. Field trip required.

363 Landscape Architectural Recreation Design V 4(2-4) Prereq junior in L.A. Principles and techniques for recreation planning and design at varying scales.

399 Professional Work Experience: Office Practice 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; office practice.

467 Regional Landscape Inventory and Analysis V (2-9) 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 557.

468 Advanced Projects in Planning and Design 5 (1-12) Prereq L A 467. Individual or group studio project in landscape architectural design or regional planning; exploring advanced techniques, methods, and programming.

470 Senior Landscape Architectural Design VI 4(2-4) Prereq senior in L.A. Design, form giving, and presentation techniques—verbal, graphic, and written.

475 Senior Project Proposal 1 Prereq senior in new L.A. Program planning for senior project. S, F grading.

480 Professional Practice 2 Prereq senior in new L.A. Current business practices and project management techniques in the profession.

490 Planning and Design in Developing Countries 3 Same as R P 490.

Library Science
Lib S 304 Learning Resources 3 drop

Management
Mgt 201 Introduction to Business Administration 3 drop


371 Applications Program Development 3 new Prereq Mgt 350, Cpt S 241, or COBOL programming experience. Advanced program design principles; relative files, screen formatters, report writers, and designing to reduce future maintenance requirements.

372 Database Management Systems 3 Prereq new Cpt S 241; Mgt 350. Database management systems and non-procedural languages; principles of file design and optimization.

448 Introduction to Management Information Systems 3 Prereq Mgt 301, 350. Information management of the information resource, uses of computer-based systems to improve management decision-making.

472 Systems Analysis and Design 3 Prereq Cpt S 370; COBOL. The application of systems analysis and design to the development of information systems; systems development life cycle.

489 Entrepreneurial Management 3 Prereq Mgt new 301; Mgt 360; Fin 325. Philosophy and nature of entrepreneurship for all business organizations; analytical, financial, and interpersonal entrepreneurial skills.

505 Operations Management 3 Prereq QMeth new 215. For MBA and other graduate students with limited training in operations management. Managing the operations function; tools and techniques.

Management and Systems, name change for field of specialization: Quantitative Methods to Business Statistics and Data Processing.

Marketing, Department of—(was Finance & Marketing)
Mktg 462 Marketing Models and Analysis 3 Prereq Cpt S 105; Math 201; QMeth 215, Mktg 360. Theory and evaluation of marketing models and their significance to the analysis of marketing problems.

568 Social Issues in Marketing 3 drop

Material Science and Engineering
MSE 220 Metallurgy 3 (0-0) Prereq major in new MSE. Principles and techniques of optical metallography and other laboratory methods in modern physical metallurgy.

522 Advanced Topics Laboratory 1 or 2 drop

542 High-Temperature Phenomena in Solids 3 drop

Mathematics
Math 171 [2] Calculus I (4-3-2) Prereq Math 107, 108 or satisfactory math placement score. Differential and integral calculus of one variable with associated analytic geometry. Credit not normally granted for more than one of Math 140, 171, 202, and 205.

172 Calculus II (4-3-2) Prereq Math 171. Techniques and applications of one variable calculus; estimations; series; derivative of a vector function.

200 (105) Mathematics for Elementary Education I 3 Prereq 2 yrs HS algebra or Math 101. Problem solving; structure, operations, and algorithms of whole numbers, integers, and rational numbers; measurement; ratio and proportion; graphs. (drop GUR status)

300 Mathematics for Elementary Education II 3 Prereq Math 200. Continuation of Math 200. Discovery; problem posing and solving; concrete embodiments of arithmetical concepts; calculators and computers; probability and statistics; informal geometry.

527 Algebraic Topology 3 Prereq Math 526. new Basic homotopy theory; spaces, homotopy theory, and applications. (a/y) Cooperative course taught at the University of Idaho (Math ID523).

528 Algebraic Topology 3 Prereq M 527. new Continuation of Math 527. (a/y) Cooperative course taught at the University of Idaho (Math ID524).

552 Galois Theory 3 Field extensions, automorphisms, normality, splitting fields, radical extension, finite fields, separability. (a/y) Cooperative course taught at the University of Idaho (Math ID552).

553 Ring Theory 3 Ideals, quotient rings, modules, radicals, semi-simple Artinian rings, Noetherian rings. (a/y) Cooperative course taught at the University of Idaho (Math ID551).

554 Linear Algebra 3 Prereq Math 420. Vector spaces, direct sums, quotient spaces, similarity, Jordan forms, inner products, eigenvalues, eigenvectors, spectral theory. (a/y) Cooperative course taught at the University of Idaho (Math ID550).

Mechanical Engineering
M E 210 Production Processes 4 (3-3) drop

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. Joint listing with the University of Idaho (ES ID320).

310 Manufacturing Processes 3 Prereq M E 301; major in engr. Cutting operations, metal forming by deformation, material fabrication; non-traditional processes.

311 Manufacturing Processes Lab 1 (0-3) new Prereq M E 301, M E 310 or c/i; major in engr. Laboratory experience in basic processing techniques.

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. Joint listing with the University of Idaho (ME ID313).

348 Dynamics Systems 3 Prereq M E 313; major in engr. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.

349 Dynamics Systems Laboratory 1 (0-3) new Prereq M E 348 or c/i. Laboratory investigation of dynamics problems.

406 Laboratory III 3 (1-6) Prereq M E 305, 404 or c/i; major in M E. Investigations involving solid-body mechanics, heat transfer, and fluid mechanics.

416 Design of Engineering Systems 3 (1-6) new Prereq M E 305; M E 312, 414; major in M E or E E. Design of mechanical systems integrating thermal sciences and solid-body mechanics aspects.

417 Design of Thermal Systems 3 (1-6) new Prereq M E 404 or c/i; major in M E or E E. Design of thermodynamic systems.

424 Flow of Compressible Fluids 3 Prereq M E 301, 303. Quasi-one-dimensional flow, shock waves, unsteady one-dimensional flow and steady two-dimensional flows. Joint listing with the University of Idaho (ME ID424).

473 Computer Aided Design 3 Prereq Cpt S 203; M E 313; major in engr. Interactive computer programming and graphics in the design of engineering systems. Joint listing with the University of Idaho (M E ID473).

495 Internship in Mechanical Industry 2(0-6) May be repeated for credit; cumulative
maximum 6 hours. By interview only. Prereq major in M.E. Student to work full time on engineering assignment in approved industries with industrial and faculty supervision.

512 Physical Gas Dynamics V 2-3 drop
551 Turbulent Flow and Diffusion 3 Prereq new C E 315 or M E 303. Theories of turbulent motion; statistical description and numerical models. (agy)
562 Synthesis of Thermal Power Systems 3 drop

**Basic Medical Science**

Med S
502 Topics in Medical Science V 1-3 For WAMI students only. Development of individual projects. S, F grading.
533 (523) System of Human Behavior 2 Interactive nature of biomedical, psychological, and social factors influencing illness; applying psychological principles in the medical setting.

**Microbiology**

Micro
495 Internship in Microbiology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq Micro 201, 310, 311. Experience in work related to specific career interests. S, F grading.
510 Molecular Biology of Microbial Morbidity 2 drop
550 Mechanisms of Pathogenesis 2 drop
555 Intracellular Parasites 2 drop

**Music**

A new credit/contact hour ratio has been approved for all Music Performing Group courses. The ratio is 4 contact hours per 1 hour credit. (NOTE: courses are listed on p. 280 of the 1985-87 Catalog.)

Mus
101 Elementary Organ V 1-4 drop
104 Elementary Horn V 1-4 drop
105 Elementary Trumpet V 1-4 drop
106 Elementary Trombone V 1-4 drop
107 Elementary Baritone V 1-4 drop
108 Elementary Tuba V 1-4 drop
109 Elementary Percussion V 1-4 drop
110 Elementary Violin V 1-4 drop
111 Elementary Viola V 1-4 drop
112 Elementary Violoncello V 1-4 drop
113 Elementary Contrabass V 1-4 drop
114 Elementary Flute V 1-4 drop
115 Elementary Oboe V 1-4 drop
116 Elementary Clarinet V 1-4 drop
117 Elementary Bassoon V 1-4 drop
118 Elementary Saxophone V 1-4 drop
226 Opera Workshop 1 drop
229 Ensemble Laboratory 1 (0-3) drop
231 Choir 1 drop
232 University Singers 1 drop
233 Vocal Ensembles 1 drop
235 Chamber Music 1 drop
236 Concert Bands 1 drop
238 Jazz-Lab Band 1 drop
241 Accompanying 1 drop
243 Percussion Ensembles 1 drop
244 Marching Band/Varsity Band 1 (0-3) drop
257 (237) Jazz Improvisation 1 May be repeated for credit; cumulative maximum 3 hours. Melodic jazz improvisation.
390 Instruments for Elementary Education 2 or 3 Prereq ESL/ESE 300. Skill building and teaching methods in percussion, melody and harmony instruments for use in the elementary grades.
442 Chamber Orchestra 1 drop
443 Percussion Ensembles 1 drop
451 Seminar in Counterpoint 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 553. Contrapuntal techniques of the 16th and 18th century with original stylistic writing.
452 Tonal Counterpoint Seminar 2 drop
483 Seminar in Ensemble Conducting 1 (0-3) Prereq Mus 482. Practical laboratory experience directing musical groups in rehearsal.
554 Seminar in 20th Century Styles 2 drop
564 Opera Literature 2 drop
565 Choral Literature 2 drop
581 Instructional Procedures in Brass Instruments V 2-3
585 Seminar in Vocal Physiology 2 drop
584 Instructional Procedures in Woodwind Instruments V 2-3
586 Instructional Procedures in Percussion Instruments V 2-3
589 Seminar in Instructional Procedures in Choral Music 2 drop
590 Music Education V 1-3 drop

**Native American Studies**

Na Am
205 Native American Arts 3 drop
208 American Indians to 1830 3 drop
209 American Indians from 1830 3 drop

308 [K] North American Indian History, new Prehistory to Present 3 Same as Hist 308.

**Naval Science**

NS
200 Seminar V 1-2 (Idaho) drop
311 Evolution of Warfare 3 (Idaho) drop
400 Seminar V 1-2 (Idaho) drop

**Nursing**

Nurs
200 Profession of Nursing 2 Theoretical/historical aspects of professional nursing; development of nursing roles, scopes of practice, problem solving, and ethical decision making.
201 Profession of Nursing 1 Theoretical/historical aspects of professional nursing; development of nursing roles, scopes of practice, problem solving, and ethical decision making. (for 1985-86, 1986-87 only)
202 Profession of Nursing II 1 Prereq Nurs new 201. Continuation of Nurs 201. (for 1985-86, 1986-87 only)
305 Scientific Concepts for Nursing I 3 drop
306 Clinical Nursing I 10 drop
308 Gerontologic Nursing 2 drop
310 Pharmacological Basis of Nursing Practice new 1 I By interview only. Major drug classes, pharmacokinetics, mechanisms of drug action, toxic effects; nursing implications including age, misuse, patient education. (for 1985-86, 1986-87 only)
311 Pharmacological Basis of Nursing Practice new II 1 Prereq Nurs 310. By interview only. Continuation of Nurs 310 (for 1985-86, 1986-87 only).
315 Scientific Concepts for Nursing II 4 drop
316 Clinical Nursing II 12 drop
320 Nursing Concepts: Foundation 3 Prereq new Nurs 310, 312, 530 or co/; junior in Nurs. By interview only. Nursing concepts foundational to care of well/fll clients; nursing process, nurse/client roles, communication, relationship, basic needs and teaching-learning theories.
321 Nursing Practice: Foundations 4 (0-12) new Prereq junior in Nurs. By interview only. Clinical application of the nursing process; psychomotor skills and interpersonal relationships in the care of adult clients.
330 Nursing Concepts and Practice: Health new Assessment 3 (2-3) Prereq junior in Nurs.
By interview only. Holistic multi-dimensional assessment of the well client throughout the adult years; comparison of findings with established norms.

Nursing Concepts: Parent-Child 5 Prereq Nurs 320 321, 331, 340 or c/l. By interview only. Theoretical concepts undergirding holistic nursing care for families during childbearing and childrearing, incorporates wellness/illness concepts and developmental theory.

Nursing Concepts: Parent-Child 6 (0-18) Prereq Nurs 320, 321, 331, 340 or c/l. By interview only. Multi-dimensional assessment of childbearing and childrearing families; development of nursing skills/judgments for holistic care of childbearing and childrearing families.

Nursing Leadership: Research 3 Prereq senior in Nurs. By interview only. Concepts and approaches used in investigation of nursing problems; research critique process; evaluation and interpretation of statistics.

Nursing Leadership: Group Theory and Practice 2 (1-3) Prereq Nurs 320, 313. By interview only. Group theories and dynamics; nursing process applied to group as client; co-leading experience to develop group leadership skills.

Nursing Leadership: Critical Issues 3 Prereq Nurs 401, 402, 420, 421; 440, 450, or c/l. By interview only. Selected issues critical to the profession of nursing; application of management/leadership theory.

Introduction to Research in Nursing 3(2-3)

Clinical Nursing III 12 (5-12)

Advanced Concepts in the Care of the Critically Ill and Injured Patient V 3-5

Emergency Nursing V 3-4

Nursing Concepts: Adults 4 Prereq Nurs 340, 341. By interview only. Theoretical basis for nursing management of clients throughout the adult lifespan; health/illness problems which occur commonly in society.

Nursing Practice: Adults 6 (0-18) Prereq Nurs 340, 341; 420 or c/l. Nursing process in management of adults of all ages with health/illness problems; holistic approach to patients using nursing process; development of clinical judgment and skills.

Nursing Community Health II 3 Prereq Nurs 420, 421. Nursing process applied to community clients; health care delivery, scope of practice, community health problems, community assessment and high-risk populations.

Nursing Practice: Community Health V 3 (0-9) to 4 (0-12) Prereq Nurs 403, 440. Clinical experience providing nursing services in selected community settings; community assessment; management theory application.


Nursing Practice: Psychiatric/Mental Health 3 (0-9) to 4 (0-12) Prereq Nurs 450 or c/l. Clinical application of nursing process with clients experiencing acute and chronic psychiatric/mental health disruptions; management theory application.

Maternal-infant Care 5 Prereq Nurs 341. By interview only. Intensive study and clinical experience with mothers and infants (SS).

Special Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Nurs 320. By interview only.

Special Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Nurs 320. By interview only.

Nursing Theory and Research I 3 Prereq graduate student in Nursing. Theory development and research in nursing; literature review; problem identification, conceptual framework, design, and sampling.

Nursing Theory and Research II 3 Prereq Nurs 501. Data collection and data analysis; theory, nursing and research; presentation of results; relationship between research and nursing practice.

Theory Development and Evaluation V 2-4 Prereq graduate student in Nursing. Theories and conceptual models in nursing; identification and application of strategies for deriving testable hypotheses.

Professional Issues 2 Prereq graduate student in Nursing. Key issues affecting health care and the nursing profession; societal trends and issues and the implications of nursing.

Nursing Service Administration: Theory and Role Analysis 4 Prereq graduate student in Nursing. Key issues affecting nursing administration; nursing and management theories for application in nursing service settings.

Personnel Management in Nursing 3 Prereq graduate student in Nursing. Theories and concepts related to human behavior in the work situation; staffing, recruitment, orientation, performance appraisal, labor-management relations.

Practicum in Nursing Administration 5 (1-12) Prereq Nurs 508, 513, 514, 574. Management theories, concepts, processes in field experiences; leadership behavior/validity of the role of nurse manager.


Nursing Education: Theory and Role Analysis 3 Prereq graduate student in Nursing. Key issues affecting nursing education; application of educational theories in a variety of nursing education settings; critical analysis of concepts.

Multimedia Approaches to Instruction and Evaluation V 2-4 Prereq Nurs 521. Group and individualized instruction and evaluation; creating instructional software, use of TV studio, AV, and computers.

Practicum in Nursing Education 5 (1-12) Prereq Nurs 508, 521, 523, 574. Seminar and individualized field experience in classroom and clinical settings; application of educational theories, and processes relevant to nurse educators.

Advanced Psychiatric/Mental Health Nursing 3 Psychopathology and appropriate nursing interventions with individuals across the age continuum, families, groups, and communities.

Psychiatric/Mental Health Nursing: Concepts and Role Analysis 4 Selected therapeutic approaches and issues in psychiatric/mental health nursing; interdisciplinary relationships.

Practicum in Psychiatric/Mental Health Nursing 5 (1-12) Prereq Nurs 541, 543, 574. Field experience/seminar with focus on assessment, diagnosis, treatment of clients, families, groups, communities; mental health concepts/approaches.

Advanced Concepts in Transcultural Nursing 3 Prereq graduate student in Nursing. Transcultural nursing and ethnomedicine; sociocultural and biocultural theories of health and illness; applicability to nursing and health care.

Advanced Nursing Concepts 3 Prereq graduate student in Nursing. Nursing's distinctive domain in the health care system; conceptualization of clinician's diagnostic reasoning process; evaluation of the nursing diagnosis framework.

Advanced Nursing Concepts II 3 Prereq Nurs 571. Family, community, and health systems as they relate to nursing diagnoses and treatment of health problems.

Advanced Nursing Practice V 3-4 Prereq Nurs 561, 571, 572. Field experience/seminar; nursing diagnoses and interventions in management of selected client problems; clinical application of research.

Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours.

(600) Independent Study Variable credit.

Nutrition

Nutrition 500 Seminar in Nutrition 1 May be repeated for credit; cumulative maximum 5 hours. Seminar on current research issues in nutrition.

Advanced Food Chemistry 3

Food Chemistry 3

Energy Metabolism 3

Nursing and Aging 2 or 3

Nutrition Program Theory and Practice 3

Pharmacology and Toxicology

P/T

Statistics Analysis 3 Prereq intro stat. new Statistics research: multiple regression, contingency tables, chi-square, experimental design, analysis of variance, analysis of covariance and multiple regressions. Cooperative course taught at the University of Idaho (AP 11044).

Philosophy of Pharmacology and Toxicology 1 By interview only. Historical perspectives, current characteristics, and trends in pharmacology and toxicology.

Principles of Toxicology 3 Principles of modern, predictive toxicology; actions, biological disposition and environmental
fate of natural products, drugs, pesticides, food chemicals and pollutants.

506 Principles of Pharmacology 4 Prereq biochem or Zool 355. Fundamental mechanisms of drug action and the factors that modify drug responses; fundamentals of medicinal chemistry.

509 Clinical Anesthesiology and Pharmacology 4 (0-12) Prereq 4th year in Vet Med. Instruction and practical experience in anesthesiology; evaluation of safety and efficacy of animal drug therapy.

511 Topics in Toxicology V 1-4 May be repeated for credit; cumulative maximum 12 hours. By interview only. Topics of current interest in toxicology and closely related areas.

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. By interview only. Topics of current interest in pharmacology and closely related disciplines.

526 Advanced Analysis in Pharmacology/Toxicology 3

529 Neurochemistry 3 Same as V Ph 529.

531 Principles of Medicinal Chemistry 2

537 Physiology and Biochemistry of Neuroneptides 3 Same as V Ph 537.

543 Principles of Comparative Pathology 4 (3-3) Prereq 300-level Zool course. Gross and micro pathology, histological techniques, neoplasia. Cooperative course taught at the University of Idaho (V DS 512).

561 Receptorology 2 Prereq P/T 506. The role of ligand-receptor interactions in biological responses to drugs and poisons. (a/v)

562 Advanced Pharmacology 3

565 Teratogenesis, Carcinogenesis, and Mutagenesis 2 Prereq P/T 505. Toxic-induced changes in mammals resulting in teratoma, neoplasms, and mutations. (a/v)

566 Target Organ Toxicity 2 By interview only. Chemical toxicity manifested in damage to a specific organ or function of liver, kidney, lung, nerve, cardiac and skin tissue. (a/v)

567 Toxicological Testing Strategies V 1-2 Prereq P/T 505, 565. Principles of toxicity testing, decision theory, good laboratory practices, protocol development and risk assessment methods. (a/v)

579 Pharmacology and Toxicology Seminar 1 May be repeated for credit; cumulative maximum 12 hours. By interview only. S, F grading.

**Pharmacy**

**Phar**

311 Pharmacuetics I 3 Prereq Math 140; Chem 240 or 340; Phar 331. Theory, preparation, and application of solution dosage forms.

317 (417) Non-Prescription Drugs and Health Care Accessories 2 Quality and use of non-prescription drug items and selected health care products.

331 Organic Medicinal Chemistry 3 Prereq Chem 240 or 340. The organic chemistry of living systems, particularly that which applies to drug design and action.

401 Clinical Pharmacology 3 (4-3) Prereq Phar 342, 406, 411, 436, 467, 472, 473. Biopharma-

404ucetics and pharmacology applied to clinical situations, drug information and evaluation, disease states. Hospital Pharmacy 2

405 Professional Practice 8 (0-24) Prereq Phar 406; senior in Phar. An externship providing practical professional experience in various pharmacies under the supervision of an approved pharmacist preceptor.

406 Therapeutic Agents 3 (1-6) Prereq Phar 312, 314, 471. Professional competence in applying principles of pharmacuetics, medicinal chemistry and pharmacology to selecting therapeutic products; dispensing procedures; clerkship preparation.

408 Clinical Clerkship V 4 (0-12) or 8 (0-24) May be repeated for credit. Phar 401, 406. Externship providing clinical experience in the delivery of health care and the role of the pharmacist in patient care. (310) The Pharmacist and Social Health 2 The pharmacist's role in individual and group health problems.

411 Pharmacuetics III 4 Prereq Phar 300, 311, 312. Kinetics of drug absorption, distribution, and elimination; dosage regimen design; bioavailability.

412 Pharmacuetics Laboratory III 1 (0-3) Prereq Phar 300, 311, 312, 313, 314. Advanced techniques for the exerimentation of compounding and dosage forms. I/V admixtures.

419 Drug Induced Diseases 2 Prereq Phar 401, 406, 476 or c/l. Incidence, mechanisms, manifestations, treatment and/or prevention of drug induced diseases.


464 Toxicology 3 Prereq Phar 472 or c/l. Symptomatology, prevention, treatments, and demography of toxic reactions to drugs and household, agricultural, and economic poisons.

467 Human Pathology 3 Prereq Zool 315 or c/l. A fundamental study of disease processes in man.

471 Chemical Pharmacology 4 Prereq Zool 315, 335 or c/l; BC/HP 364; Phar 331 or Chem 342; Phar 467. Mechanisms of drug action and factors modifying drug responses; physiopharmacological properties of drugs; drug receptor interaction; development of drugs.

482 Pharmacy Law 2 Prereq senior in Phar. Laws relating to pharmacy and professional practice.

484 Pharmacy Administration 3 Prereq Econ 201; senior in Phar. Problems and procedures in the establishment and management of a pharmacy.

**Philosophy**

**Phil**

102 [C] Writing and Reasoning 3 Application of critical thinking skills to essay writing.

355 Seminar in Theory of Knowledge 3 Prereq 3 hours Phil. Problems of immediate knowledge and mediate knowledge, modes of cognition (a/v) Joint listing with the University of Idaho (Phil ID 431).

370 The Rights and Welfare of Animals 3

370 Environmental Ethics 1 or 3 Ethical problems arising from our utilization of natural resources; case studies.

390 Topics in Philosophy 3 May be repeated for credit; cumulative maximum 6 hours.

420 Existentialism 3 Prereq 3 hours Phil. Movement of religious and non-religious existentialism beginning with Kierkegaard and Nietzsche, and Heidegger, Sartre, Merleau-Ponty, Buber, and Tillich. (a/v) Joint listing with the University of Idaho (Phil ID 421).

425 Seminar in Philosophy of Science 3 Prereq 3 hours Phil. Purpose and logical structure of science; human implications. (a/v) Joint listing with the University of Idaho (Phil ID 412).

430 Philosophy of Literature 3

445 Seminar on Social and Political Philosophy 3 Prereq 3 hours Phil. Problems of normative social and political theories; historical and contemporary philosophers. (a/v) Joint listing with the University of Idaho (Phil ID 431).

450 Seminar in Philosophical Psychology 3 Prereq 3 hours Phil. Theories of mind, self, mental acts, psychological states and human actions. (a/v) Joint listing with the University of Idaho (Phil ID 442).

460 Seminar on Ethical Theory 3 Prereq 3 hours Phil. Problems of ethical, historical, and contemporary philosophers. (a/v) Joint listing with the University of Idaho (Phil ID 441).

470 Philosophy of Law 3 Prereq 3 hrs Phil. Selected topics pertaining to moral and philosophical evaluation of law. Cooperative course taught at the University of Idaho (Phil ID 410).

**Physical Education**

**PEP**

220 Officiating V 1(0-3) to 2(1-3) May be repeated for credit; cumulative maximum 4 hours.

261 Anatomy V 2(3-2) Human skeletal structure and articulations, skeletal musculature, the nervous, respiratory, and circulatory system. Joint listing with the University of Idaho (PB ID 261).

296/297 Applied Computer Technology in new Physical Education, Sport, and Recreation 1 Applying computer technologies for controlling data in movement sciences, and performance activities.

385 (393) Methods of Water Safety Instruction 2 (1-3) Prereq PEACT 255. Red Cross water safety certificates awarded to those who qualify.

390 Practicum in Coaching V 1(0-3) to 4(0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum. S, F grading.

391 Practicum in Athletic Training V 1(0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum. S, F grading.

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1 Combined maximum for PEP and RLS 300-level practicum courses—8 hours.
Political Science

Pol S 301 Political Simulations 2 Preq Pol S 101
new Preparatory for and participation in political simulations. Must be taken simultaneously with a designated upper-division political science course.

310 Democratic Government 3 drop
375 Chicano/Latino Politics 3 Same as Ch St new 375.
410 Government of Canada 3 drop
414/514 Inter-American Relations 3 drop
428 European Diplomacy 1848-1914 3 drop
462/562 Human Issues in International Development 3 Same as Anth 462/562.
471 Contemporary South Asia 3 Same as Hist drop 471.
472/572 Government of Great Britain 3 Political new institutions and policy making processes in Great Britain. Credit not granted for both Pol S 472 and 572.
473/573 Governments of France and the new German Federal Republic 3 Political institutions and policy making processes in France and the German Federal Republic. Credit not granted for both Pol S 473 and 573.
474 African Politics 3 Same as Bl St 474.
477/577 Medicine and Politics 3 Political dimensions of biomedical technological growth; conflict between individual rights and societal interests; the role of government in the conflict. Cooperative course taught with the University of Idaho (PolSc ID 477/577).
530 The Scope of Political Science 3 Preq Pol Sci 12 hrs Pol S. Historical development and present status of the discipline; contemporary issues and future trends. Joint listing with the University of Idaho (PolSc ID 530).
531 Research Methods in Political Science 3 Preq 12 hrs Pol S, Soc 221. Development of research designs; methods of data collection; analysis of data; computer applications. Joint listing with the University of Idaho (PolSc ID 531).
561 Seminar in U. S. National Security Policy 3 U. S. defense and arms control policies; current strategies and weapons issues. Joint listing with the University of Idaho (PolSc ID 561).
557 Government Budgeting 3 Federal, state, city, and county budgeting systems. Cooperative course taught at the University of Idaho (PolSc ID 557).
590 Seminar in U. S. Foreign Policy 3 May be repeated for credit; cumulative maximum 6 hours. Preq one course in international relations, international law, organization, or American foreign relations. Methodology, decision-making institutions and processes. Joint listing with the University of Idaho (PolSc ID 590).
591 Seminar in Public Policy Formation 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PolSc ID 591).
592 Topics in Public Administration 3 May be repeated for credit; cumulative maximum 6 hours. Preq Pol S 440 or 445. Joint listing with the University of Idaho (PolSc ID 592).
593 Seminar in Public Law 3 May be repeated for credit; cumulative maximum 6 hours. Preq Pol S 500. Emphasis on substantive law or judicial process. Joint listing with the University of Idaho (PolSc ID 593).
594 Seminar in Political Theory 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PolSc ID 594).
595 Seminar in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PolSc ID 595).
599 Research Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours. S, F grading.

Psychology

Psych
101 [S] Introductory Psychology: Scientific drop Foundations 3
102 [S] Introductory Psychology: Human Behavior 3
105 [S] Introductory Psychology: Biological, Social, and Physical Influences on Normal and Abnormal Human Behavior 3
220 Psychology of Stress 3 Preq Psych 105.
230 Human Sexuality 3 Preq Psych 105. Sexuality in personal development; personal, cultural, biological influences on sexual identity and behavior; fertility, reproduction, sexual functioning, sexuality and personality.
306 Industrial/Organizational Psychology 3 Preq Psych 105. Individual and group goals; organizational structure and theory; leadership, design of jobs, personnel selection and training; engineering psychology.
307 Human Factors 3 Preq Psych 105. Human limitations and capabilities in architectural and engineering design; system analysis.
328 (285) Experimental Methods in Psychology 3 Preq Psych 105 and 311. Designing, conducting, and reporting research in selected areas of experimental psychology.
352 (325) Self Control 3 Preq Psych 105. Analysis of self-control problems; application of behavioral principles to student-conducted projects.
355 Aggression 3 Preq Psych 105. Theories, concepts, and research on the psychology of aggression. Cooperative course taught at the University of Idaho (Psych ID 422).
366 Psychological Disorders of Children 3 Preq Psych 105; Psych 361 or CPS 240. Intellectual and emotional disorders of children.

Plant Pathology

Pl P
429 (329) General Plant Pathology 3 (2-3) Preq Bio S 105 or Bot 120. Classification, symptoms, causes, epidemiology, and control of diseases of economic plants.
563 Advanced Forest Pathology V 2-4 (Idaho) drop 564 Advanced Forest Pathology V 2-4 (Idaho) drop

Physics

Phys
564 Atomic and Molecular Phenomena 3 drop
572 Methods of Theoretical Physics 3 drop
595 Nuclear Physics Seminar 1 or 2 drop

Psych
Swedish

301 First Semester Swedish 4
drop
302 Second Semester Swedish 4
drop
350 Scandinavian Literature in English 2 May be repeated for credit. Scandinavian literature in English from Ibsen, Strindberg, and Brandes to the present.

Veterinary Anatomy

V An
423 Veterinary Neuroscience 3 (2-3)
drop
550 Research Principles and Methods of drop Anatomy 1 (0-3)

Veterinary Clinical Medicine and Surgery

V MS
457 Clinical Anesthesiology 2 Prereq 3rd year new in Vet Med. Clinical anesthesiology for the professional veterinary students. drop
471 Introduction to Surgery 1
489 Large Animal Preventive Medicine 3 drop

Veterinary Microbiology

V Mic

Veterinary Physiology and Pharmacology

V Ph
518 Veterinary Physiology 5 Prereq V Ph 519. Physiology of domestic animals.
530 Neurochemical Techniques 1 (0-3)
drop
531 Pharmacology/Toxicology 15 (4-3) Prereq 2nd year in Vet Med. Pharmacology and toxicology of the systems of domestic animals.
532 Veterinary and Comparative Toxicology 2 drop
533 Pharmacology/Toxicology II 4 (3-3) Prereq V Ph 531. Pharmacology and toxicology of the systems of domestic animals. Completion of V Ph 531.
537 Physiology and Biochemistry of new Neuropeptides 3 Prereq BC/BP 563, V Ph 517, or Zo/ol 553. Synthesis and metabolism, use as neurotransmitters and neurohormones, mechanisms of receptor interactions.
591 Themes in Science and Physiology 1 new Science and physiology from historic, philosophic, methodologic, and social perspectives. S, F grading.

Veterinary Pathology

V Pa
445 Pathology I 3(2-3) Prereq V An 406; V Ph 418. Structural and functional alterations in disease; elementary oncology.
446 Pathology II 0(3-3) Prereq V Pa 445. Principles of system and organ response to disease.

Vocational Technical Education (See Adult and Youth Education).

Interdisciplinary University Courses

Univ
800 Doctoral Research, Dissertation, and/or new Examination Variable credit. (For Interdisciplinary Ph.D. only.)

Wildlife Biology, Program In—(new program and course prefix; course listed below transferred from Zo/ol to WI B)

WI B
328 Animal Population Dynamics 3 Prereq calculus; Bio S 104. Structure and dynamics of animal populations; theoretical and applied aspects of population ecology.
340 Wildlife Field Studies 1(0-3) Prereq WI B 230. Seven day trip (spring vacation) to observe and discuss wildlife research and management by regional, federal, and state conservation agencies.
432/532 Wildlife Nutrition 3(2-3) Prereq Org Chem. Nutritional requirements and interactions of wildlife populations. Credit not granted for both WI B 432 and 532.
499 Special Problems V 1-4 May be repeated for credit.
501 Raptor Ecology 2 The natural history of North American raptorial birds; population dynamics and food habits. Cooperative course taught at the University of Idaho (Zool 1532).
503 Workshop: Wildlife Topics 2 (Idaho)
drop
540 Waterfowl Ecology and Management 3(2-3) Selected literature on North American waterfowl ecology and management. (a/y)
544 Game Management 3 Prereq WI B 435. Big game species and their populations and habitats; objective balance of the components of habitats with population levels. (a/y) Cooperative course taught at the University of Idaho (Wif 1544).
546 Upland Game Ecology 2 Prereq WI B 435. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. (a/y) Cooperative course taught at the University of Idaho (Wif 1546).
588 Advanced Topics in Wildlife 1-5 May be repeated for credit; cumulative maximum 10 hours. Biology and management of wildlife species. Joint listing with the University of Idaho (Fore 580).
593 Seminar 1 May be repeated for credit.
600 Special Projects or Independent Study new Variable credit.
700 Master's Research, Thesis, and/or Exam newination Variable credit.

Women Studies

W Sr
210 Gender in Technology 3 Development skills for overcoming anxieties about math, computers, and the effects of new technologies on our lifestyles, environment, and physiology.
343 Sociology of Professions and Occupations drop 3
402 Cross-Cultural Gender and Kinship 3 Same as Anth 402.
410 Racism and Sexism in Language 3 drop
450 Family and Socialization 3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>135</td>
<td>Animal Natural History 3</td>
<td>Classification, identification, life history and behavior of animals, with emphasis on those commonly found in the Pacific Northwest.</td>
</tr>
<tr>
<td>408</td>
<td>Introduction to Mathematical Biology 3</td>
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<tr>
<td>486</td>
<td>Marine Invertebrate Communities 1 (0-3)</td>
<td>Prereq Bio S 104. An extended trip to Friday Harbor Laboratory to gain first-hand experience with several marine habitats. Cooperative course taught at the University of Idaho (Biol ID 486).</td>
</tr>
<tr>
<td>507</td>
<td>Electron Microscopy Laboratory 3 (0-9)</td>
<td>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.</td>
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<tr>
<td>557</td>
<td>Advanced Vertebrate Physiology 4 (2-6)</td>
<td>Prereq BC/BP 364; Zool 353. Principles of vertebrate physiology illustrated through contemporary analytical and instrumental procedures. (a/y)</td>
</tr>
<tr>
<td>574</td>
<td>Experimental Analysis of Development 2 (0-6)</td>
<td></td>
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<tr>
<td>586</td>
<td>Special Projects in Electron Microscopy</td>
<td>V 2 (0-6) to 3 (0-9) May be repeated for credit. By interview only. Practical training in one or more areas of electron microscopy: TEM, SEM, ultramicrotomy, specimen processing, darkroom procedures.</td>
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