# Academic Calendar

## First Semester
- Faculty Meeting, 4:15 p.m., Tuesday
- Registration, Thursday and Friday (For all students)
- Classes begin, Monday
- Freshman grades due in Registrar's Office, 9:00 a.m., Monday
- Thanksgiving vacation begins, 5:00 p.m., Tuesday
- Thanksgiving vacation ends, 8:00 a.m., Monday
- Christmas vacation begins, 12:00 noon, Saturday
- Christmas vacation ends, 8:00 a.m., Monday
- Final examinations, Monday through Saturday
- Final grades due in Registrar's Office, 9:00 a.m., Monday

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## Second Semester
- Registration, Thursday and Friday (For all students)
- Classes begin, Monday
- Freshman grades due in Registrar's Office, 9:00 a.m., Monday
- Spring vacation begins, 12:00 noon, Saturday
- Spring vacation ends, 8:00 a.m., Monday
- Final examinations, Monday through Saturday
- Final grades due in Registrar's Office, 9:00 a.m., Monday
- Commencement
- Graduation, Sunday

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## Summer Session
- Registration, Monday
- Classes begin, Tuesday
- Independence Day (a holiday)
- Six-week session ends, Friday
- Eight-week session ends, Friday

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Daniel J. Evans
Governor of the State of Washington
Advisory Member Ex Officio

Michael Dederer, President
Seattle

Harold A. Romberg, Vice President
Spokane

H. H. Hahner
Walla Walla

H. Dewayne Kreager
Seattle

Howard W. Morgan
Tacoma

Lyle W. Neff
Pasco

Mrs. Henry B. Owen
Seattle

Glenn Terrell, Secretary Ex Officio
Pullman

The Governor of the State, the Superintendent of Public Instruction, the members of the State Legislature, and the County Commissioners are ex officio visitors of Washington State University.

The annual meeting of the Board of Regents is held on the first Wednesday in April. Other meetings are called periodically throughout the year.
The University Council of Washington State University

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President

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Executive Vice President

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Vice President—Academic

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Acting Dean, College of Engineering

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Dean, College of Agriculture

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Assistant Attorney General

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Director, Systems and Computing

Claude Simpson, MA
Registrar, Editor, University Catalog

G. Donald Smith, PhD
Director of Libraries

Jane E. Werden, PhD
Dean, College of Home Economics

Allen I. White, PhD
Dean, College of Pharmacy

Herbert J. Wood, PhD
Acting Senior Dean,
College of Sciences and Arts
Washington State University is a multipurpose publicly supported institution. It provides ever-increasing opportunities for undergraduate and graduate education. It is engaged in fundamental and applied research. Through its off-campus extension services it disseminates the results of research to the citizens of the state and the nation.

The university consists of eight colleges and a graduate school and offers more than 66 undergraduate degrees and a continually increasing number of curricula leading to masters' and doctoral degrees. It is consistently strengthening its offerings in traditional academic areas even as it is expanding its activities into new fields of study.

Washington State University has been alert to the changing demands made upon American educational institutions. The university's radio station was a pioneer in educational broadcasting, and the Washington State University Honors Program is the only all-university, integrated program for superior students at a major American university. The only department of police science in the Pacific Northwest is at Washington State. A bureau of economic and business research and a division of governmental studies and services carry out investigations of importance to industrial, commercial, and public service activities.

The university's hydraulics laboratory has designed models for hydroelectric dams built in the United States and in foreign countries, while the laboratory of zoophysiology has acquired a world-wide reputation. A primate research center, a comparative behavior laboratory, a graduate curriculum in computer science, a flourishing laboratory of anthropology, an interdisciplinary program in environmental sciences, an internationally recognized research program in plant genetics, a doctoral program in engineering science, and interdepartmental graduate programs in American studies and literary studies are examples of the university's efforts in recent years to respond to the needs of life in twentieth-century America.

The student body at the university consists of young men and women from a variety of social and economic backgrounds, and Washington State is continually developing programs of study for students with diverse professional and educational interests. Students are enrolled from every county in the state, and undergraduate enrollment is almost evenly balanced between the western and eastern parts of Washington. More than 1,000 students come from states other than Washington, and approximately 400 students are from foreign countries. Experimental programs for disadvantaged students and an active policy of encouraging students from minority groups to enroll at Washington State are indications of the university's acceptance of its social responsibilities and of its policy of making the campus an intellectually stimulating place for learning and living.

The faculty at Washington State University contains many dedicated teachers and scholars. Faculty members have been awarded Guggenheim fellowships and Fulbright scholarships, they have participated in international conferences, and they have served as consultants and advisers to state, national, and foreign agencies. They have held national and regional offices in professional organizations, have been editors of learned journals, and have been the authors of textbooks and scholarly studies. Specialized educational and research programs directed by university faculty members have been supported by the United States government, by business firms, and by private foundations.

Accreditation

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

The institution is a member of the National University Extension Association and is listed in the official publications of the U.S. Office of Education and the State Department of Public Instruction.
Several departments and colleges are accredited by professional accrediting associations recognized by the National Commission on Accrediting. This information is included in the introductory material of the various departments and colleges.

The Campus

Washington State University is located at Pullman in the southeastern part of the state. In addition to the main campus, the university maintains 5,107 acres of farmland and eight agricultural research centers at Long Beach, Lind, Prosser, Mt. Vernon, Vancouver, Wenatchee, Pullman, and Puyallup. Modern classroom buildings, special research and instructional equipment, student living accommodations, the university library, hospital facilities, auditoriums, gymnasiums, and administrative offices are all located on campus and are easily accessible to students and visitors.

University buildings and equipment are valued at over $100 million, and in recent years a number of important teaching and research facilities have been constructed on campus. These include the C. Clement French Administration Building; Kimbrough Hall, the music building; Johnson Tower, addition to Todd Hall; Heald Hall, the biological sciences building; Cleveland Hall, the education building; a remodeled facility for foreign languages, the old Administration Building; a new physical education facility; and a design disciplines building.

Many recreational facilities are located on campus. These include a nine-hole golf course, sixteen all-weather tennis courts, and two swimming pools. The nearby hills offer opportunities for skiing, tobogganing, hiking, picnicking, and camping.

Rogers Athletic Field, covering eight acres, includes a football field and a quarter-mile track. The stadium has a capacity of 23,000. The baseball team uses Bailey Field. The Women's Athletic Field includes two and one-half acres. Special playing fields afford an opportunity for fall and spring outdoor intramural competition.

Student Life

Student Personnel Services

A comprehensive student personnel program relates the many phases of student life outside the classroom to the university's instructional program. The program attempts to assist every student in deriving the greatest benefit from his university experience.

Living Facilities

Washington State University is one of the largest residential institutions of higher learning in the western United States. More than 73 per cent of the students live on campus in residence halls, married student apartments, fraternities, and sororities. This campus residence program provides a full-time education, combining the formal work of the classroom with out-of-class experience gained in living with fellow students.

The university provides comfortable and modern residence hall accommodations for all students who desire them. The residence halls are: Men—Ferry, Gannon, Goldsworthy, Orton, Rogers, Stimson, and Waller; Women—Coman, Community, Davis, Dunn, Kruegel-McAllister, McCroskey, Regents, Scott, Stevens, Sterritt-Perham, and Wilmer; Coeducational—Stephenson Residence Center; Nell—used for men or women as the need dictates. Apartments for married students are also available.

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

The national sororities at the university are: Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Omicron Pi, Alpha Phi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Gamma, Gamma Phi Beta, Kappa Alpha Theta, Kappa Delta, Kappa Kappa Gamma, Pi Beta Phi, and Sigma Kappa.
Fraternities with chapter houses at Washington State are: Acacia, Alpha Gamma Rho, Alpha Kappa Lambda, Alpha Tau Omega, Beta Theta Pi, Delta Chi, Delta Sigma Phi, Delta Tau Delta, Delta Upsilon, FarmHouse, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Theta, Phi Kappa Tau, Phi Sigma Kappa, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Kappa Epsilon, Theta Chi, and Theta Xi.

Students living in residence halls, fraternities, and sororities elect their own officers, and there are various executive and coordinating organizations through which cooperative projects may be carried on. Junior and Senior Panhellenic consider matters of common interest to sororities, while the Interfraternity Council represents the fraternities.

The Residence Hall Association acts on behalf of the men's and women's residence halls.

The House of Representatives of the Associated Women Students is made up of all the presidents of the women's living groups on campus.

Housing Regulations

All single freshman men (those students with fewer than 30 hours of college credit) under twenty-one years of age are required to live in an organized men's living group (a fraternity or residence hall) which is officially recognized by the university unless they are in their own homes.

Single undergraduate women are to live in women's residence halls or other organized living groups unless they are residing in their own homes or have permission of the Dean of Women's office.

Single undergraduate women who have 60 or more hours of academic work, or who are at least twenty years of age during the semester for which they are applying, may have the privilege of living off campus. Students requesting this permission must make application at the Dean of Women's office. Those students who are under twenty-one years of age must have approval of parents. This provision does not alter the terms of the room and board contract.

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 his extracurricular interests. Student service organizations include Crimson Circle of Omicron Delta Kappa, a service honorary for senior men; Mortar Board, a national senior women's service honorary; Spur's, a national service honorary for sophomore women; Intercollegiate Knights, a national service honorary for sophomore men; and Alpha Lambda Delta, a freshman women's honorary. Religious, recreation, and other specialized interest groups carry on a number of campus activities.

Student Government

The Associated Students of Washington State University is governed by the Senate. The Senate consists of 12 to 16 representatives elected from residential districts, five representatives elected at large, and the chairman of the Senate. Under the jurisdiction of this legislative branch are student-faculty committees concerned with Activities Policies, Student Publications, the Bookstore, Human Relations, Social Responsibility, and the Planning Council. There are also five Advisory Councils on Facilities Use and Planning, Student Housing, Social Problems, Academic Policy, and Activities and Recreation.

The executive branch includes the president, who has veto power over the Senate, and the vice president, both of whom are elected on the same ticket. Under their jurisdiction are 27 student committees organized under four boards: Program, Student Educational Relations, Social, and
Recreation. The president is responsible for appointments to all student and student-faculty committees, the Advisory Councils, and the faculty-student committees such as Discipline, Traffic Control, and International Advisory, which are under the jurisdiction of the President of the university. All appointments are made with the consent of the Senate.

The president, vice president, and chairman of the Senate are salaried. General elections are held each year in the spring.

Student Publications

Student publications provide opportunities for students to express themselves and to gain experience in the publication of a variety of printed materials. The goal of each publication is to provide information for students, staff, alumni, and other readers interested in Washington State University.

"The Daily Evergreen" is issued to students during the nine months of the regular school year. "The Chinook" is the university yearbook issued each summer by the Associated Students. Various living groups and professional and social organizations issue publications from time to time.

Religious Activities

Pullman's churches represent many denominations and welcome all students to their activities. In addition, the YMCA and the YWCA are located on campus to work with individuals as they grow and develop an understanding of themselves and their relationship to others.

Wilson Compton Union

The Wilson Compton Union is the campus community center. More than a building, it is an educational program of out-of-class activities designed to provide for the students' personal, social, and cultural development; practice in leadership; and management and enjoyment of leisure activities. The ASWSU Activities Center coordinates and guides existing student organizations and assists 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 interests and needs.

The Union, which has undergone an extensive remodeling and expansion program, has facilities for student activities, conferences, and conventions sponsored by campus groups. Facilities include food service of all kinds, meeting rooms, a games area, U.S. Post Office, barber shop, travel service, music listening lounges, and guest rooms for campus visitors.

Student Health Service

The Student Health Service is located in Memorial Hospital, a modern, completely equipped, and accredited fifty-bed general hospital. The hospital is owned and operated by the community of Pullman even though it is located on the university campus. The Student Health Service rents clinic space from the hospital and utilizes the facilities of the hospital such as laboratory, X-ray, pharmacy, and beds for student patients.

Physicians are on duty in the clinic from 8:00 a.m. to 12:00 noon and from 1:00 to 5:00 p.m., Monday through Friday, and from 8:00 a.m. to 12:00 noon on Saturday. Five-day hospitalization for any one illness or accident is provided by the Student Health Service, and a supplemental hospitalization insurance plan is offered to the student at his own expense. This plan supplements the Student Health Service program and covers off-campus hospitalization for sickness and accidents for twelve months. Entrance physical examinations and tuberculin tests or X-rays are required for all new undergraduate and graduate students and must be performed by the family physician and be on file in the Student Health Service prior to registration. These are filed with the student's clinic record.
All international students are required to have a chest X ray taken at Memorial Hospital in Pullman, Washington. No chest X ray taken in any other country will be accepted. These X rays need not be taken prior to registration but should be taken as soon thereafter as possible. All international students are required to take the WSU supplemental insurance, and if they have dependents living here with them then the dependents must also be insured.

Student Counseling Center

The Student Counseling Center offers specialized individual and group counseling and testing services without charge to any regularly enrolled student. Counselors with psychological training are available to talk over with the individual student his plans for the future, his potential ability to succeed in university study, the appropriateness of his vocational goals, his command of study skills, and any other matters of concern to his personal or social adjustment.

The Counseling Center also serves as the university representative for a variety of national testing programs such as the Graduate Record, Miller Analogies, Medical College Admission Test, Law School Admission Test, and Washington Pre-College Testing Program.

The center maintains an up-to-date library of materials on more than 200 occupations for students who wish to obtain additional information about various vocational fields. Students may make use of this library of occupational information with or without discussions with a counselor.

Reading Center

The Reading Center assists students to improve their reading and study skills. The service is available to all students. Inquiries about testing and reading classes should be made to the Department of Education.

Speech and Hearing Clinic

The Speech and Hearing Clinic helps students to correct speech problems involving defective articulation (such as lisping and defective "r" and "l" 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, lipreading, and auditory training for persons with hearing disabilities. Application should be made to the Speech and Hearing Clinic of the Department of Speech immediately after registration. There is no charge to students.

Placement Bureau

Information concerning the training and background of WSU graduates is gathered by the Placement Bureau as a centralized source of information that is readily available to prospective employers. Business, education, government, and industry send representatives to the campus for the purpose of interviewing graduates at all degree levels. Arrangements for these visits are made at the Placement Bureau, and students' information files are made available to interviewers. Employers who contact Washington State by mail are also furnished similar information. In addition, the Placement Bureau processes student applications for part-time work while attending the university and extends aid to students seeking summer employment opportunities.

Facilities and Equipment

The Library

The Washington State University Library, with a collection consisting of over two and one-half million items, is an integral part of the educational facilities of the institution. In addition to approximately 900,000 bound volumes and many thousands of manuscripts, maps, charts, microfilms, art prints, and photographs, the li-
library regularly receives more than 8,500 magazines, technical journals, periodicals, and newspapers. National, state, and municipal documents from this and foreign countries as well as scholarly publications of institutions and societies are also received. The library is a depository for selected United States government materials and receives most of the documents and publications of the United Nations. A collection of over 3,000 motion pictures, 2,000 35mm. filmstrips, and several hundred recordings and transcriptions is a part of the audio-visual materials. In addition to the general collections for teaching and research, the library has special collections of unusual richness and rarity in the Manuscripts-Archives Library.

The physical features of the library are conducive to quiet study, research, and recreational reading. Books are arranged on open stacks and current periodicals are available in convenient areas. A limited number of carrels for the use of graduate students and others engaged in research are distributed throughout the building.

The library is arranged into divisional libraries, which are devoted generally to one of the three major divisions of knowledge. In the Humanities Library are books and related materials in the fields of philosophy, religion, fine arts, language, literature, and music. In the Social Science Library are found books and related materials in the fields of anthropology, business, economics, education, history, psychology, and sociology. The Science Library contains books and periodicals essential to the study of the applied and pure sciences, and is also a depository for Atomic Energy Commission materials. In the Science Library also are books on photography and home economics.

The Audio-Visual Center provides a wide variety of nonbook materials and specialized equipment for the instructional and research programs of the institution. A Graphic Laboratory is an integral part of the center. Here are produced teaching materials such as charts, diagrams, transparencies, and other illustrative aids.

The Education Library, located in Cleve-

land Hall, serves as a place of study convenient to the teaching and office areas of the College of Education. This library houses a laboratory collection of curriculum materials containing sample textbooks, courses of study, juvenile literature, and an audio-visual laboratory.

The Veterinary Medical Library in Wegen Hall houses materials essential for the veterinary curricula.

Nuclear Reactor Laboratory

The Nuclear Reactor contributes to research and instruction for Washington State University, the state, and the region. The TRIGA III-type reactor operates at 1,000 kilowatts and can be pulsed to peak powers of two million kilowatts. Associated laboratory facilities include fast and thermal neutron irradiation tubes, pneumatic transfer tubes, a 17,000-curie cobalt-60 source, and an automated neutron diffractometer. Counting equipment includes two 20 cc Ge(Li) detectors, two dual-parameter analyzers with magnetic and punched paper tape readin/readout, a fast printer, and a fast plotter.

A two-million-volt Van de Graaff accelerator produces heavy ions for low-energy physics research. Auxiliary equipment includes a scattering chamber for multiparticle breakup studies, a 14-MeV neutron facility, a hot-atom chemistry cell, a precision surface scattering spectrometer, and a vacuum evaporation system for target preparation.

A 7,000-square-foot addition will house laboratories for health physics, biophysics, neutron activation analysis, and transuranic spectroscopy. The reactor facilities are available to all departments for research and teaching and the reactor staff offers guidance and assistance on projects.

Radio-Television Services

The Radio-Television Services operate two radio stations and one television station. KWSU-AM is one of the nation's pioneer
educational radio stations. KUGR is the student-operated, low-power campus station. KWSU-TV, the university-owned public television station, is received in all the major population areas of eastern Washington. The services produce radio and television programs which are distributed statewide by the Tape Network to educational and commercial broadcasting stations. Students are included on the working staffs for both radio and television stations.

University Theatre

The University Theatre presents a widely varied program of productions of all kinds: Regular Series, Studio Series, Touring Theatre, and Summer Theatre. Interested students are invited to contact the Director, University Theatre, for information regarding participation in any aspect of the program—performing, technical, or management.

Museums

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 during regular office hours.

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. In addition to the dome room, there are two other rooms containing auxiliary astronomical apparatus and decorated with illuminated transparencies.

The University Planetarium in Sloan Hall, which uses a Spitz console-type projector, seats approximately eighty.

Computing Center

The Computing Center plays an active role in research and teaching. Facilities include an IBM System 360 Model 67, an IBM 360 Model 20, and an EAI 690. These facilities are available to faculty members, graduate students, and advanced undergraduates for research, special projects, and theses. Many students submit computer programs, prepared as a part of their course assignments, for processing. A self-service equipment room is provided for the convenience of users. A library contains books and journals related to computing in addition to standard application programs which are available to users.

Washington State University Press

The Washington State University Press imprint is placed upon books and monographs designed for a scholarly audience, and the copyright for Press books is held in the name of the President and Regents of the university. In recent years books have been published in the fields of genetics, anthropology, English literature, history, German literature, political science, and economics. The Press also acts as publisher for the journals Research Studies, Northwest Science, Biotropica, Poe Newsletter, and Plant Science Bulletin.

The Summer Session

Washington State University conducts an eight-week Summer Session for graduate, undergraduate, and transient students as an integral part of its year-around operation.

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, regular university students, and others qualified to pursue them to advantage. Emphasis is also placed on a program of advanced work for teachers and school administrators. Shorter sessions varying from one to six weeks for regular courses, special conferences, and institutes are also features of the Summer Session.
The Summer Session Bulletin, published annually in January, is available upon request to the Registrar, Washington State University.

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:

The academic function includes administration of one hundred International Exchange Awards; administering student educational exchanges between Washington State University and foreign universities; acting as a clearing house for interested WSU staff and students on matters relating to study and teaching abroad, including student and faculty Fulbright awards and Peace Corps liaison. The office works with and administers programs of foreign student sponsoring agencies such as African Scholarship Program of American Universities (ASPAU), 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).

The office administers and coordinates home campus and participant training affairs of the AID-financed Intervarsity Exchange Program with the West Pakistan Agricultural University at Lyallpur.

Scholastic Regulations

Washington State University and its various colleges reserve the right to change rules regulating admission to, instruction in, and graduation from Washington State, and any other regulations affecting the student body. Such regulations shall be considered in effect whenever the proper authorities may determine and shall apply to respective students and to those who may at that time be enrolled. For current academic Regulations, see the Annual lime Schedule.

Admission—General Information

Admission to Washington State University is granted without regard to race, creed, color, or national origin.

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.

The Board of Regents of Washington State University has adopted the following requirements for admission.

To be eligible for admission to Washington State University, a student must be a high school graduate and show evidence of good moral character.

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

No specific subject-matter pattern is required for entrance. However, the faculty strongly recommends that the prospective student have a high level of competence in the areas of English, foreign languages, mathematics, natural science, and social science. Recommendations for high school subjects that should be completed according to the various degree programs may be found in the publications “Careers Through the Curriculum at W.S.U.” and “Preparing for Study at Washington State University,” which are available from the Office of Admissions.

If the student is applying for fall semester admission, he may submit his application at any time after December 1 and must complete his application not later than August 1. Comparable dates for spring semester admission are October 15 and January 15.

The complete application includes the appropriate application form and transcripts of all high school and college records.

Exceptions to the admission require-
ments may be made only by the Admissions Committee.

Application forms for freshman admission are available in the high schools of Washington. Out-of-state and advanced standing applicants should request forms from the Office of Admissions.

Freshman Requirements

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

Students coming from outside the state of Washington must meet all of the above requirements, meet the requirements for admission of major institutions in their home state or province, submit scores of the Scholastic Aptitude Test of the College Entrance Examination Board, and, in addition, present a high school record showing a satisfactory subject-matter pattern of college preparatory courses. Ordinarily it is necessary that nonresident freshmen have approximately a 3.00 (B) grade average and above-average CEEB scores. No special consideration will be given any nonresident not fully meeting these requirements.

Sons and daughters of W.S.U. alumni living outside the state of Washington need not submit scores of the Scholastic Aptitude Test of the College Entrance Examination Board, but will be required to pay nonresident tuition and fees.

Graduates of unaccredited high schools should write to the Director of Admissions for further information.

All applicants must complete the Washington Pre-College Test. Those living in Washington should take the test when it is given in their high school. Out-of-state students will take the test on campus immediately prior to freshman registration.

All eligible applicants may be considered for admission on the basis of three years of accredited high school work, such admission to be bona fide, provided the applicant maintains a satisfactory record and graduates from high school prior to the opening of the following college year.

Advanced Standing Requirements

Transfer students will be admitted if the total evidence (academic record, test results, recommendations, and interviews) indicates a reasonable probability of success. A student must have a 2.00 (C) average to be considered for transfer. Those students with a 2.30 or above are assured of admission. Students between 2.00 and 2.30 will be considered individually. Advanced standing applicants with less than 24 semester hours of transfer credit will be considered for admission if they meet both freshman and advanced standing admission requirements. Applicants with 24 or more semester hours of transfer 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; however, all advanced standing may be tentative pending the satisfactory completion of at least one semester's work in residence.

Application is made by submitting a completed application form, available from the Director of Admissions, and official transcripts from each institution attended showing that the applicant is in good standing.

Advanced standing credit shall not be granted for more than the number of years for which the junior college or other institution is accredited. The last two years or 60 semester hours of credit of a baccalaureate degree program must be taken at an accredited baccalaureate degree-granting institution. In addition, the senior year, normally two semesters or 30 semester hours of credit, must be completed at Washington State University.
Advance Payment on Tuition and Fees

All undergraduate applicants except special students, contract students, foreign students (other than Canadians) and faculty and staff members are required to submit a nonrefundable advance payment on tuition and fees in the amount of $50.00 prior to final admission. The advanced 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.

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 to students who submit College Entrance Examination Board Advanced Placement Examinations and score a three (3) or higher. The College Entrance Examination Board College Level Examination may also yield credit. Washington State Institutional Entrance Placement Examinations and scores on the Washington Pre-College Test plus high school achievement are other measures of establishing placement and credit.

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

Former Students Returning—Not Enrolled the Previous Semester

Students formerly enrolled at Washington State University wishing to return must request an application for reenrollment not later than August 1 for the fall semester and January 15 for the spring semester. Requests for reenrollment applications should be made to the Office of Admissions. All former undergraduate students who apply and have been advised of acceptance, except special students, contract students, foreign students (other than Canadians), and faculty and staff members, are required to submit a nonrefundable advance payment on tuition and fees in the amount of $50.00 prior to the deadlines of August 1 and January 15. When requested, the payment should be sent directly to the Controller.

Selection of a Major

Students seeking a university degree must organize their efforts in a particular department or a group of related courses. This is the student's major which should be chosen early.

If an entering freshman knows with reasonable certainty what he wishes to major in, he may elect that major when he applies for admission. He may, if he chooses, defer this selection until, but not beyond, the end of the sophomore year.

Each freshman is assigned to a faculty adviser in his major interest area by the Coordinator of the Curriculum Advisory Program, or if he wishes to pursue general courses, he will be assigned an adviser relative to that situation. At any time after the completion of the freshman year (30 hours) the student may "certify" his major. The chairman of his major department then becomes his adviser.

Students with advanced standing who enter with 60 or more semester hours enroll in their chosen department. Students who transfer with between 30 and 60 hours are assigned to their major department unless they are uncertain about a major, in which case they are assigned to a faculty adviser by the Coordinator's office.

Departmental Requirements

Some departments have special requirements which, if not completed in high school, must be taken in college. These are listed in the sections devoted to the various departments.
Pass-Fail Grade Option

Effective the fall term 1968 the faculty and students initiated a three-year experimental Pass-Fail Option applicable for not more than 18 semester hours of credit in a regular four-year program. Transfer students and students in five-year programs are permitted a total number of credits on a pro rata basis. The maximum pass-fail enrollment is six credits in any one semester and three credits or one course during a summer session.

Numbering System of Courses

a) Courses numbered 051 do not carry university credit.

b) Courses numbered 100-199 inclusive are normally taken by freshmen.

c) Courses numbered 200-299 inclusive are normally taken by sophomores.

d) Courses numbered 300-399 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.

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

f) Courses numbered 500 or above are primarily for graduate students. Qualified seniors may take these courses for graduate credit during their last semester or summer session. Other qualified seniors may (with permission of their department chairman) take these courses for undergraduate credit.

g) Special Problems (599) and Research, Thesis, or Examination (600) have as a prerequisite regular student status in the Graduate School.

Explanation of Symbols

[ ] Course partially meets a General University Requirement for Graduation, i.e., [B] biological science; [C] composition; [H] humanities; [P] physical science; [S] social science; [Z] science.

(531) Old course number from preceding catalog, i.e., B A 532 (531).

3 Figure following course title indicates the hours of credit.

(2-3) Hours of lecture and laboratory required each week during the semester, with lecture being the first figure and laboratory the second.

I II S Time the course is to be offered, i.e., I—first semester; II—second semester; S—summer session.

a/y Alternate years.

c// Concurrent enrollment.

Definition of Semester Hour

A semester hour is ordinarily defined as one lecture or recitation a week for the duration of the semester. For every hour of credit, it is expected that the student will spend two hours a week in outside preparation or three hours a week in independent study or laboratory work. The proportion of time of each course to be given to lecture, laboratory, library, or independent study is determined by the faculty of the department offering the course. The term “semester hour” corresponds to the terms “credit,” “hour,” or “credit hour” used at other institutions; and, in the description of courses in the schedules of the catalog, it is abbreviated to “hour.”

Grades and Grade Point System

A—4 grade points per credit hour.
B—3 grade points per credit hour.
C—2 grade points per credit hour.
D—1 grade point per credit hour.
F—0 grade points per credit hour.
P—Credit given—grade points not calculated.
S—Credit given—grade points not calculated.
I, W, and X—no credit or grade points.

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

Freshman Class 1—Students with zero through 29 1/2 semester hours of credit.

Sophomore Class 2—Students with 30 through 59 1/2 semester hours of credit.

Junior Class 3—Students with 60 through 89 1/2 semester hours of credit.

Senior Class 4—Students with 90 or more semester hours of credit who have not received a baccalaureate degree.

Post-baccalaureate Class 5—Students who have received a bachelor's degree who may be working toward a second bachelor's degree or a teaching certificate and who have not been admitted to the Graduate School.

Graduate Student Class 6 and Class 0—Students who have been admitted to the Graduate School.

Special Undegree Class 8—Students who do not desire admission but wish to pursue work for personal enrichment.

Transient Student Class 9—Students who enroll for a summer session and have not applied for regular admission as a degree candidate at WSU.

must have the permission of the Academic Standing Committee in order to reenroll.

An undergraduate student who fails to make a 1.80 grade point average at the end of both of two consecutive semesters will be automatically dropped from the institution and will be allowed to enroll only on recommendation of the Academic Standing Committee.

No student having less than 30 hours of credit shall be permitted to enroll unless he has at least a 1.80 cumulative grade point average or the permission of the Academic Standing Committee.

No student having 30 or more hours of credit shall be permitted to enroll unless he has at least a 2.00 cumulative grade point average or the permission of the Academic Standing Committee.

Application for permission to enroll for fall must be filed by August 1.

When permission of the Academic Standing Committee is granted for enrollment, a student shall be on probation, subject to the supervision and direction of that committee, and at its discretion, his enrollment may be limited or his extracurricular activities curtailed, or both. If the committee refuses a student permission to enroll and if at a later date it grants him permission to reenroll, he shall be re-enrolled on probation, regardless of the length of time he has been absent from Washington State University.

Honors and Distinctions

The Freshman Honor Roll. A freshman earning not less than 14 hours in courses carrying grade points in the fall semester who ranks scholastically in the top ten percent of the freshman class is placed on the Freshman Honor Roll.

The University Honor Roll. An undergraduate student receiving a minimum grade point average of 3.30 in one semester, based on at least 14 hours of enrollment of which at least 12 hours are in courses carrying grade points, is placed on the University Honor Roll and receives a certificate from the President of the university.
The President’s List. An undergraduate student receiving a minimum grade point average of 3.80 in one semester from A and B grades in at least 14 hours of enrollment of which at least 12 hours are in courses carrying grade points is placed on The President’s List and receives a personal letter of congratulations from the President of the university.

Graduation Honors. Students meeting the requirements specified under “Graduation with Honors,” “High Honors,” “Highest Honors,” or “Distinction,” as listed under Academic Regulations, will receive their degrees marked with the honors for which they qualify.

Requirements for Graduation

A student who has (a) completed any of the four-year collegiate curricula, (b) completed the General University Requirements for Graduation, (c) spent the equivalent of two semesters (30 semester hours) in residence, normally the final two semesters, may become a candidate for the degree of Bachelor of Arts or the degree of Bachelor of Science, depending upon the field of study. Residence credit is credit earned on the campus in Pullman. Candidates must also present a minimum of 120 semester hours of credit plus the required physical education activity courses for graduation for a four-year degree.

A student desiring a second bachelor’s degree shall satisfy the second degree program and present not less than 150 semester hours of credit plus the required physical education activity courses.

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 his field of study.

Correspondence course credit is limited to not more than 25 per cent 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 stud
Fine Arts, B A, M F A
Food Science, M S, Ph D
Foods and Nutrition (Home Ec M S)
Foreign Languages, B A, M A
Forestry, M S
Forest Management, B S
Genetics, M S, Ph D
Geography, B A
Geology, B S, M S, Ph D
History, B A, M A, Ph D
Home Economics, B A, B S, M A, M S
Horticulture, B S, M S, Ph D
Hotel Administration, B A
Hydraulic Engineering, M S
Industrial Arts, B A
Interior Design, B A
Literary Studies, Ph D
Materials Science, M S
Mathematics, B A, M A, Ph D
Mechanical Engineering, B S, M S
Mining Engineering, B S
Music, B A, B Mus, M A
Nuclear Technology, M S
Nursing, B S
Nutrition, M S, Ph D
Office Administration, B A
Pharmacy, B Phar
Pharmaceutical Science, M S, Ph D
Philosophy, B A, M A
Physical Education, B S, M S, Ph D
Physical Metallurgy, B S
Physics, B S, M S, Ph D
Plant Pathology, M S, Ph D
Police Science and Administration, B S, M A
Political Science, B A, M A, Ph D
Psychology, B S, M S, Ph D
Range Management, B S, M S
Recreation, B A, M A
Sanitary Engineering, M S
Science, B S
Social Studies, B A
Sociology, B A, M A, Ph D
Soils, B S, M S, Ph D
Speech, B A, M A, Ph D
Structural Engineering, M S
Veterinary Medicine, D V M
Veterinary Science, M S, Ph D
Vocational Technical Education, M S
Wildlife Biology, B S, M S
Zoology, B S, M S, Ph D
Zoophysiology, Ph D

General University Requirements for Graduation

1. **English Composition**—3 hours (Engl 101).
   In special cases the following may be used: Engl 103, 188, 201, 301.

2. **Physical Education Activity**—four semesters.

3. **Humanities and Social Sciences**—12 hours from the list below.
   At least 3 of the 12 hours must be in humanities and 3 hours in social sciences.
   Students may not include more than two courses in any one field or any courses in their major department.

4. **Sciences**—12 hours from the list below.
   At least 3 of the 12 hours must be in the biological sciences and at least 3 hours in the physical sciences.
   At least 2 of the 12 hours must be credit for 6 clock hours of laboratory work per week.
   Students may not include more than two courses in any one field or any courses in their major departments.

**HUMANITIES:**
Anthropology 201
Architecture 115, 116
Communications 101
English 108, 199, 209, 210, 245, 246, 303, 304, 332, 333, 334, 335
Fine Arts 101, 208, 209, 212, 214, 316, 318, 320

**Foreign Languages:**
French 199, 203, 204, 220, 221, 333, 334, 421, 432, 441, 442, 451, 452
German 199, 203, 204, 220, 221, 333, 334, 432, 442
Russian 203, 204, 230, 411
Spanish 203, 204, 220, 221, 333, 334, 422, 472
History 390, 391
Humanities 101, 102, 103, 201
Music 160, 162, 263, 264
Philosophy 100, 101, 102, 107, 201, 207, 220, 310, 330
Speech 112, 160

SOCIAL SCIENCES:
Anthropology 101, 103, 198
Black Studies 370, 380
Economics 102, 198, 201, 203
Geography 102, 105, 323, 331, 333
History 101, 102, 120, 121, 198, 240, 241, 250, 251, 360, 370
Political Science 101, 102, 198, 222
Psychology 101, 198, 201
Social Science 101

SCIENCES:
Biological Sciences:
Bacteriology 101, 201
Biological Science 101 (Non Laboratory), 102, 103, 104, 298
Botany 201, 232
Genetics 201
Zoology 251, 330

Physical Sciences:
Astronomy 135 (Non Laboratory)
Chemistry 101, 102, 105, 106, 111, 212
Geology 101, 250, 302
Physical Science 101 (Non Laboratory), 298, 390
Physics 101, 102, 171, 172, 201, 202, 281, 282

Sciences:
Cpt S 200
Mathematics 105, 106, 171, 181, 198, 201, 300 (Non Laboratory)

College of Sciences and Arts
Department of Education (Elementary)
Industrial Arts
Department of Economics
(including Geography)

The requirements for the areas listed above are 21 hours of humanities and social sciences of which at least 6 hours must be in humanities and 6 in social sciences from the list above.

In the College of Sciences and Arts the requirement in the sciences is the same as the General University Requirement except that the total must include four courses. In addition, students who have not had two years of one foreign language in high school must take one year of one foreign language in college.

Students meeting these additional requirements who are also candidates for the provisional teaching certificate may substitute Hist 455 and Pol S 206 for 6 of the hours in the social sciences with approval of their dean.

Expenses

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. Changes may be made at any time and are effective when established by the Board.

REFUND POLICY
Semester Registration Fees
Tuition, incidental, and student activity fees 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. If withdrawal occurs on or after the sixth day of instruction but within thirty calendar days from the beginning of instruction, 50 per cent of tuition, incidental, and student activity fees will be refunded. After thirty days from the beginning of instruction, no portion of the fees will be refunded. Tuition, incidental, and student activity fees will be refunded in full if withdrawal is by students called into the military service of the United States at any time during a semester in which they receive no academic credit.

Summer Session Registration Fees
Summer session fees will be refunded in full if the student officially withdraws prior to the fourth day of instruction. After the third day of instruction, no portion of summer session fees will be refunded.
### Summary of Yearly Expenses

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Board and Room:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic year 1970-71</td>
<td>$936.00</td>
<td>$936.00</td>
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<tr>
<td>Academic year 1971-72</td>
<td>986.00</td>
<td>986.00</td>
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<tr>
<td><strong>Registration Fees</strong></td>
<td>432.00</td>
<td>1,080.00</td>
</tr>
<tr>
<td><strong>General Damage Deposit</strong></td>
<td>7.00</td>
<td>7.00</td>
</tr>
<tr>
<td><strong>Hospitalization Insurance (optional)</strong></td>
<td>19.90</td>
<td>19.90</td>
</tr>
<tr>
<td><strong>Textbooks and Supplies</strong></td>
<td>80.00 (est.)</td>
<td>80.00 (est.)</td>
</tr>
<tr>
<td><strong>Variable Personal Expenses</strong></td>
<td>200.00 to 450.00</td>
<td>200.00 to 450.00</td>
</tr>
</tbody>
</table>

**Refundable**

### Tuition and Fees

#### REGISTRATION FEES (per semester)

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate and Graduate Students</td>
<td>$216.00</td>
<td>$540.00</td>
</tr>
<tr>
<td>College of Veterinary Medicine Additional Incidental Fee per Semester, DVM Enrollees Only</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Information concerning children of disabled or deceased veterans and handicapped students can be found under Financial Assistance. Only residents of Washington are eligible.

¹ The applicable nonresident student tuition, incidental, student activity, and Veterinary Medicine incidental fees are required of each student whose legal residence is outside the state of Washington. The term "nonresident student" shall mean all full-time students other than resident students. The term "resident student" shall mean all full-time students who have been domiciled in this state at least one year prior to the commencement of the semester for which they register, children and spouses of federal employees residing within the state, children and spouses of military personnel assigned to Washington State University, and children and spouses of staff members of the university. The fees, except damage deposit, will be waived for each employee of Pullman School District 267 who enrolls in classes within the limits of 6 hours per semester and who is at the same time cooperating in the student-teacher program. Pullman School District personnel may enroll in more than 6 hours providing tuition and fees are paid for the hours in excess of the 6. The summer session fees for the session immediately following the school year in which the work was performed will be waived for all such cooperating employees.
DEPOSITS

General Damage Deposit for All Students ................................................. $ 7.00
High School Summer Camp Damage Deposit .............................................. 5.00

Refund checks of all or part of deposits are mailed within six weeks after the close of the school year or summer session.

SPECIAL REGISTRATION FEES

<table>
<thead>
<tr>
<th>Description</th>
<th>Resident and Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Off-Campus Fee—Bacteriology 418, Public Health 490</td>
<td>$ 10.00</td>
</tr>
<tr>
<td>Directed Teaching Fee (off-campus)</td>
<td>68.50</td>
</tr>
<tr>
<td>Enrollment Fee for 6 hours or less</td>
<td>68.50</td>
</tr>
<tr>
<td>Special Fees for Faculty or Staff (6 hours or less)</td>
<td>38.50</td>
</tr>
<tr>
<td>No-Credit Graduate Enrollment</td>
<td>5.00</td>
</tr>
<tr>
<td>Foreign Language Instruction Fee (Pullman High School Students only)</td>
<td>20.00</td>
</tr>
</tbody>
</table>

SUMMER SESSION REGISTRATION FEES

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Courses, Pullman and Off-Campus</td>
<td></td>
</tr>
<tr>
<td>Regular Students—per Credit or Audit Hour</td>
<td>$ 15.00</td>
</tr>
<tr>
<td>Faculty and Staff—per Credit or Audit Hour</td>
<td>7.50</td>
</tr>
<tr>
<td>Special Fees</td>
<td></td>
</tr>
<tr>
<td>Military Summer Camp</td>
<td>5.00</td>
</tr>
<tr>
<td>High School Summer Camp</td>
<td>50.00</td>
</tr>
<tr>
<td>High School Summer Camp Room and Board</td>
<td>112.00</td>
</tr>
</tbody>
</table>

OTHER FEES AND CHARGES

(Not necessarily applicable to all students)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowling</td>
<td>$ 9.50</td>
</tr>
<tr>
<td>Entrance Qualifying and Graduates of Unaccredited High Schools Test Fee</td>
<td>5.00</td>
</tr>
<tr>
<td>Equitation</td>
<td>40.00</td>
</tr>
<tr>
<td>Foreign Language Reading Examination Fee</td>
<td>10.00</td>
</tr>
<tr>
<td>(The first examination in a given language is free. For each subsequent examination in the same language, the fee of $10.00 will be charged.)</td>
<td></td>
</tr>
<tr>
<td>Golf</td>
<td>5.00</td>
</tr>
<tr>
<td>Graduation, Bachelor's Degree</td>
<td>5.00</td>
</tr>
<tr>
<td>Graduation, Bachelor's Degree with Highest Honors (Including binding thesis)</td>
<td>8.00</td>
</tr>
<tr>
<td>Graduation, Master's and Doctor's Degrees</td>
<td>9.00</td>
</tr>
<tr>
<td>Microfilming Fee (applicable to Ph D and Ed D degree candidates only)</td>
<td>25.00</td>
</tr>
<tr>
<td>Placement Bureau Registration Fee (There is no fee for the first registration. Thereafter fee assessed for annual registration.)</td>
<td>5.00</td>
</tr>
<tr>
<td>Service charge for late registration</td>
<td>15.00</td>
</tr>
<tr>
<td>Teacher's Statutory Certification Fee</td>
<td>3.00</td>
</tr>
<tr>
<td>Transcript Fee</td>
<td>None</td>
</tr>
</tbody>
</table>

A reasonable number of transcripts will be furnished free of charge to each student as a lifetime service.
Residence Halls and Dining Halls

Washington State University can normally provide space in its residence halls for students who request it. The cost of room and board per person for the 1970-71 academic year will be $925; for the 1971-72 academic year the cost will be $960. This must be paid prior to registration or on an arranged installment basis. A security deposit of $25, an application, and a signed room and board contract are required before a space can be reserved. The reservation will be cancelled and advanced payments returned if the student is denied admission.

A student desiring to cancel his room reservation and receive a refund of his $25 security room deposit must notify the Director of Housing and Food Service in writing prior to August 15 for fall term or January 15 for spring term. Once the applicant has been assigned to a hall the security deposit is held to insure occupancy of the space and to guarantee against damage, breakage, and loss. The deposit is held until the individual permanently checks out of the residence hall and requests a refund of deposit.

Each student who lives in a residence hall is required to sign a “Contract for Room and Board in a Residence Hall.” This must be signed by a parent or legal guardian. This contract establishes the terms of occupancy.

All students residing in residence halls will be charged board and are required to purchase meal tickets for use in university-owned dining halls. The dining halls are managed by trained food service personnel and are operated by the university on a nonprofit basis. Operating costs of the residence halls are included in the room and board contract rates.

The Board of Regents establishes rules for the use of residence halls and married student housing.

The university reserves the right to use rooms in any of the residence halls during Thanksgiving, Christmas, or spring vacations. It reserves the right to use vacant rooms at any time.

The institution does not insure against personal property damage or loss; however, group fire insurance covering students’ personal belongings is available in the residence halls at very low cost.

For further information on housing regulations refer to the section on Student Life.

Married Students’ Housing

The university maintains a limited number of apartments for married students. A rental request for such a unit cannot be considered until an application and a security deposit of $25 are received. The assignment will be cancelled if the student is not admitted. For detailed information write to: University Housing Office, Rogers Hall, Pullman, Washington 99163.

Financial Assistance

Student Loans and Other Financial Aid

Applications and Information concerning the National Defense Student Loan Program and the College Work-Study Program may be obtained from the Office of Financial Aids, Washington State University. This same application entitles students to be considered for scholarships, if an earlier deadline is met, and for Educational Opportunity Grants if the student's documented need indicates that he would otherwise be unable to pursue a college education.

University student loan funds are maintained to assist students who need supplementary funds to continue their education. In addition to the general loan fund for all students at an interest rate of 4 per cent per annum, there are several departmental and special loan funds. The institution also participates in the federally guaranteed loan program. This program enables worthy students to borrow money for educational purposes from commercial banks at a nominal rate of interest.

Handicapped Students

The state of Washington administers several programs of assistance to needy handicapped students.
Blind students who are residents of the state of Washington may have their entire registration fee paid and receive additional funds for books, readers, and other items under provisions of either RCW 28.76.129 or RCW 74.16.181. Inquiries concerning eligibility for, and assistance 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 handicap 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 Department of Public Assistance, Division of Vocational Rehabilitation, Capitol Center Building, Olympia, Washington 98501.

Children of Disabled or Deceased Veterans

Under RCW 28.76.150, resident students between the ages of 16 and 21 having a parent who was killed or totally incapacitated by reason of service in the armed forces of the United States may have the tuition portion of registration fees waived. This program is administered by the State Board of Education, P. O. Box 527, Olympia, Washington 98501.

Scholarships

Scholarships for Entering Freshmen

An increasing number of scholarships is available to entering freshmen from accredited high schools. Information on these awards is contained in the Washington State University Financial Aid Booklet. This booklet and application forms are on file with Washington high schools, and are available by writing to the Office of Financial Aids.

Undergraduate Scholarships

Information and application forms are on file at the Office of Financial Aids. Applications for departmental scholarships should be made through the chairman of the appropriate department.

International Exchange Awards for International Students

Washington State University has been authorized under the laws of the state to give one hundred International Exchange Awards each year to students from those friendly foreign nations that will agree to make similar grants to students or graduates of Washington State University during the same year or some future year.

Recipients of these awards are exempt for one academic year from the payment of tuition and incidental fees except the damage deposit and health insurance fee. Each award amounts to $879.00 per year.

All those granted an award must hold a J, “exchange visitor,” visa. Instructions for applying for these awards are sent by the Office of Admissions at the request of the foreign student. No applications for awards are considered until it has been determined that a student is eligible for admission. All materials required for application for awards are due December 1 for spring admission and April 1 for fall admission.

Scholarships for Study Abroad

Washington State University maintains a number of exchange programs and also offers scholarships for travel costs for students undertaking bona fide course work at foreign universities. Information concerning study opportunities and scholarships may be obtained from the Office of International Programs. Students desiring credit must have the approval of the department chairman for transfer of such credits.

WSU Scholarship and Development Fund

The WSU Scholarship and Development Fund has been established by the Board of Regents for the purpose of soliciting and receiving gifts, grants, and bequests from alumni and friends of Washington State University and for the selection of projects such as faculty research, under-
Veterans Benefits

The Office of Veterans Assistance, Administration Building, cooperates with the Veterans Administration in carrying out the provisions of the public laws established to give educational benefits to veterans and children of deceased or totally disabled veterans. These bills include the War Orphans Educational Assistance Act (Public Law 634), the Veterans Readjustment Benefits Act of 1966 (Public Law 358, the G. I. Bill), the Dependency and Indemnity Compensation Act (Public Law 881), and the Vocational Rehabilitation Act (Public Law 815).

Students should gain admittance to the university before making application for benefits. Application for benefits should be made to the Regional Veterans Office at least two months prior to the student's expected enrollment.

Students attending under either Public Law 634 or Public Law 358 should plan for at least two months between the approval of their application by the Veterans Administration and their first check.
The Colleges
College of Agriculture

Louis L. Madsen, Dean

The College of Agriculture is responsible for resident instruction, research, and extension in areas of learning closely associated with agriculture and rural life. Undergraduate and graduate work is conducted on campus at Pullman, but basic and applied research and extension work are carried out at Pullman as well as many other locations throughout the state. Research efforts extend to a number of problems relating to natural resources and the production, protection, processing, marketing, distribution, and utilization of agricultural products; on nutrition and other factors related to the betterment of living and the home; and on economic and sociological problems in agriculture and agricultural business. Extension work in the broad field of agriculture and in home economics is a cooperative educational activity in which the United States Department of Agriculture, counties of Washington, and Washington State University take part.

The original concept of a college education in agriculture was limited almost exclusively to training for farming and ranching, preparation for teaching, and entrance into government employment. The modern concept and needs of agriculture have become so broad that colleges of agriculture have expanded their curricula to include preparation for agricultural careers in industries engaged in the processing of plant and animal products, or in the manufacture of equipment and supplies for the farm; in agricultural businesses concerned with farm management, farm credit, the marketing and distribution of farm products, and the sales of equipment and supplies to the farmer; in vocational agriculture teaching; in agricultural extension work; and in private and public educational and business services to the farmer. Undergraduate and graduate programs to train scientists for research, teaching, and other scientific and technical pursuits have become an increasingly important function of a modern college of agriculture.

Career opportunities in agriculture are by no means limited only to young men and women with farm backgrounds. Many fields of agriculture offer excellent opportunities and challenges for young people from cities and towns, particularly for those who are interested in the natural and social sciences and those whose vocational objectives are directed toward business, industry, public and private services, teaching, or scientific research.

The College of Agriculture offers a wide variety of curricula, majors, and courses from which students may choose according to their interests and goals. Its functions and objectives are:
1. To train technical workers for public and private agencies engaged in agricultural business, communications, conservation, and services.

2. To prepare research scientists and technologists for agricultural experiment stations, colleges, the United States Department of Agriculture, other government agencies, and private industry.

3. To provide prospective young farmers with an agricultural college education embracing scientific, business, and practical training designed to help them become better farmers.

4. To train high school and college teachers of agriculture and agricultural extension workers.

5. To provide all of its students with a liberal education and an opportunity to develop leadership ability.

Admission

There are no special admission requirements for the College of Agriculture. High school students planning to enroll in the College of Agriculture are urged to take as many science, mathematics, and agriculture courses as possible.

Degrees

The degrees listed below may be earned in the College of Agriculture:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science in Agriculture</td>
<td>Agricultural Economics, Agricultural Education, General Agriculture, Plant Pathology</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Economics, Agricultural Education, Agricultural Mechanization, Agronomy, Animal Sciences, Conservation, Entomology, Environmental Science, Forest Management, Horticulture, Range Management, Soils</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Master of Extension</td>
<td>General Agriculture</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Agronomy, Animal Sciences, Entomology, Environmental Science, Forestry, Genetics, Horticulture, Nutrition, Plant Pathology, Range Management, Soils</td>
</tr>
<tr>
<td>Master of Science in Food Science</td>
<td>Animal Sciences, Horticulture</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Agricultural Economics, Agronomy, Animal Sciences, Entomology, Food Science, Genetics, Horticulture, Nutrition, Plant Pathology, Soils</td>
</tr>
</tbody>
</table>

Transfer Students

Transfer students who have completed one year in a nonagricultural college or university ordinarily will have no difficulty in completing the requirements for one of the Bachelor of Science degrees in Agriculture 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 at Washington State University should concentrate as much as possible on General University and College of Agriculture requirements as would normally be scheduled during the freshman and sophomore years (as an example, see the Schedule of Studies under General Agriculture).
Requirements for Graduation

Requirements for graduation in the College of Agriculture vary according to the major and the degree to be granted as described in the component departmental sections of this catalog. The student and his adviser jointly have the responsibility of selecting courses to fit the student's native ability and vocational interests consistent with departmental and General University Requirements.

A university education should provide the basis for understanding and appreciating the complex environment in which we live. In view of this and as a part of his preparation for an occupational goal a student is encouraged to do more than satisfy the minimum requirements in general education.

Majors

In the College of Agriculture the student has a choice of sixteen undergraduate majors, two with separate curricula, as shown below:

<table>
<thead>
<tr>
<th>Major</th>
<th>Administering Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Separate curricula in Farm Management, Agricultural Business and Marketing, and Public and Foreign Service</td>
<td>Automotive Engineering</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>Agricultural Education</td>
</tr>
<tr>
<td>Agricultural Mechanization</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Agronomy</td>
<td>Agronomy</td>
</tr>
<tr>
<td>Animal Biology</td>
<td>Animal Sciences</td>
</tr>
<tr>
<td>Animal Nutrition</td>
<td>Animal Sciences</td>
</tr>
<tr>
<td>Animal Production</td>
<td>Animal Sciences</td>
</tr>
<tr>
<td>Conservation</td>
<td>General Agriculture</td>
</tr>
<tr>
<td>Entomology</td>
<td>Entomology</td>
</tr>
<tr>
<td>Food Science (Animal Products)</td>
<td>Animal Sciences</td>
</tr>
<tr>
<td>Forest Management</td>
<td>Forestry and Range Management*</td>
</tr>
<tr>
<td>General Agriculture</td>
<td>General Agriculture</td>
</tr>
<tr>
<td>Horticulture</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Separate curricula in Fruit and Vegetable Processing, Fruit and Vegetable Production, Floriculture, and Landscape Design</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>Plant Pathology</td>
</tr>
<tr>
<td>Range Management</td>
<td>Forestry and Range Management*</td>
</tr>
<tr>
<td>Soils</td>
<td>Agronomy</td>
</tr>
</tbody>
</table>

* Accredited by the Society of American Foresters.
The College of Economics and Business offers courses of study concerned with the understanding and operation of our economy. It offers curricula leading to training for business careers, preparation for government service and for research work, and preparation for teaching economic and business subjects.

The curricula leading to degrees in business administration at both the undergraduate and graduate level and the Department of Economics (excluding Geography) are accredited by the American Association of Collegiate Schools of Business. Its curricula embrace all the standard courses generally included in four-year collegiate programs in business administration, economics, geography, hotel and restaurant administration, and office administration. To meet the demand for a combination of training in business administration with specialized training in 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 leading to a second Bachelor of Arts degree in business administration.

Graduate work may be taken in economics and business administration in accounting, business cycles, econometrics, economic development, economic theory and the history of economic thought, economic history, finance, government regulation of business, industrial relations, international economics, labor, marketing, mathematical economics, monetary theory and policy, production, public finance and taxation, public utilities, statistics, transportation, and related fields.

Aims

The vigorous growth of economic activity in the state of Washington and more generally in the Pacific Northwest has been reflected in the demand for students trained in curricula offered by the College of Economics and Business. At the same time developments throughout the nation and the world make an understanding of economic problems necessary to more intelligent citizenship and good govern-
ment. The college expresses the desire of Washington State University to meet these needs. Its basic courses are designed to give students an understanding of the chief problems of public policy in economic matters; its complete curricula are planned for students who eventually expect to become business executives or to assume positions of research or administrative responsibility in private or governmental organizations. The structure of the college, coordinating work in both economics and business, provides a more effective program in both fields.

Admission Requirements

Admission to the College of Economics and Business is based on the satisfactory completion of one year of college work with requirements the same as those for Washington State University. For exact information regarding the acceptability of professional courses taken at other institutions, in areas of study covered by the departments of the College of Economics and Business, prospective students should communicate with the appropriate department chairman.

Teaching Policies

All curricula of the College of Economics and Business are designed with two broad purposes in mind. One is to develop in students a broad understanding of the economic system as a whole and of the place of that system in the cultural and social framework of society. Second, in order that students may obtain a more detailed mastery of a specific area, and to meet vocational and personal interests, students select a special field for more intensive study during the latter part of their work. Broad lines of public and private policy and the interrelationships between the various parts of the economy and between the individual businesses and the economy are emphasized at all levels.

Degrees

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

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Accounting</td>
<td>Business Administration</td>
</tr>
<tr>
<td>Bachelor of Arts</td>
<td>Business Administration, Economics, Geography, Hotel</td>
</tr>
<tr>
<td></td>
<td>Administration, Office Administration</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Economics</td>
</tr>
<tr>
<td>Master of Arts in Teaching of Business</td>
<td>Business Administration</td>
</tr>
<tr>
<td>Master of Business Administration</td>
<td>Business Administration</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Economics</td>
</tr>
</tbody>
</table>

The Bureau of Economic and Business Research

The Bureau of Economic and Business Research is the research division of the College of Economics and Business. The major part of the Bureau's activities consists of special investigations of the economic problems of the state of Washington, the Pacific Northwest, and the nation as a whole. The Bureau also gathers and analyzes statistical data of particular value to the people of the Pacific Northwest and encourages the pursuit of fundamental research on economic theory and business developments. The Bureau works in cooperation with the research divisions of the Colleges of Engineering and Agriculture since many of its investigations are related to the research of these other two divisions.

The results of studies conducted by the Bureau are made available to interested persons and groups through publications available at nominal cost and, in some cases, upon request.
College of Education

George B. Brain, Dean

The College of Education consists of the Departments of Education, Physical Education for Men, and Physical Education for Women.

The College of Education prepares teachers for elementary school, secondary school, and college teaching; specialists in a variety of educational fields; and administrators for schools and colleges. The college provides professional training in physical education, recreation, prephysical therapy, industrial arts, home economics, and agricultural education, and offers a variety of educational services to local school systems.

Great strength and opportunity are afforded teacher education by virtue of the program being in a multipurpose university with a land grant tradition. Not being gifted with a prophetic vision of what the future holds, the departments of the College of Education have elected to place their trust in people—students and teachers. The college holds that young people of courage, idealism, and intellectual promise, nurtured in the elements of disciplined liberal education, thorough professional training, and imbued with a respect for their calling and for high standards of workmanlike performance, will themselves rise to the demands of new circumstances, exercising discriminating choice in the options before them. The college educates students not only for adaptability, but also for responsibility in making decisions.

The General University Requirements provide a foundation for professional work in the College of Education through offerings in the humanities and in the social and natural sciences.

In accord with approved professional trends the College of Education has made provision for programs of study leading to graduate degrees and certificate programs. The direct aim of the graduate programs in the College of Education is to furnish intensive preparation of a more advanced type than is possible on the undergraduate level for those students serving in teaching, supervisory, special services, or administrative fields in elementary, junior high, senior high, community colleges, or for those persons who contemplate such work or who are interested in related areas of service.

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

The College of Education also functions as a service institution for the schools and communities in the northwest region. Services of its faculty are available for consultant purposes, school surveys, in-service programs, and school and community conferences in the departmental specialties.
<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 Arts, Recreation</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Education, Physical Education</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Physical Education, Vocational Technical Education</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Education, Recreation</td>
</tr>
<tr>
<td>Master of Education</td>
<td>Education</td>
</tr>
<tr>
<td>Master of Arts in Teaching of</td>
<td>Industrial Arts, Physical Education</td>
</tr>
<tr>
<td>Doctor of Education</td>
<td>Education</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Education, Physical Education</td>
</tr>
</tbody>
</table>

College of Engineering

Jack T. Kimbrell, Acting Dean

The College of Engineering has responsibilities for instruction, research, and extension as they pertain to the various fields of engineering. 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 research program of the college covers a wide spectrum of activity both fundamental and applied. Such activity provides opportunities for exposing undergraduate students to real engineering work, for graduate student research leading to a thesis or dissertation, for professional activity and upgrading of the faculty, and for services to the industries of the state designed to enhance the economical use of our material resources and a well-balanced industrial development.

The dissemination of technological information to industries and to the public in general is accomplished through short courses, symposia, technical publications, and by many other means. To perform these varied functions, the College of Engineering is organized into eight degree-granting departments, a Research Division, and a Technical Extension Service. The faculty of the college participates in all three areas in some way.

The courses offered cover fundamental material in the engineering sciences and the general spectrum of professional courses usually associated with areas of engineering activity. Courses in engineering are based on a sound fundamental knowledge of chemistry, physics, and mathematics. The courses in engineering are designed to give thorough training in engineering sciences and to utilize these sciences in the solution of engineering problems. The sequence of courses in each department is so planned that the graduate will have the necessary education to begin a career as a professional engineer.

The College of Engineering is accredited by the Engineers Council for Professional Development in the following curricula: agricultural engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, and physical metallurgy.

The translation of fundamental concepts and notions into useful processes, products, machines, structures, and installations is the job of the engineer. As our technology becomes more and more complex, the demands for his services and his responsibilities increase. Not only is he responsible for the engineering aspects of his job, but he must interpret his technical works to society and have some notion of their impact on the society of which he is a part. Also because of his prominence in this technological age he is expected to accept additional responsibilities as a citizen.

All programs of study in the College of Engineering stress fundamentals. It is the policy of the college to offer programs of such breadth that a graduate may choose with confidence employment from the greatest possible number of specialities in his 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.

In addition to the departmental requirements all majors in the College of Engineering must include in their degree programs a minimum of 18 hours in the humanities and social sciences. Of this total, 15 hours must be in courses selected from the following areas: history, economics, government, literature, sociology, philosophy, psychology, or fine arts. Also, 12 of the total hours must be selected from courses meeting the General University Requirements for Graduation. At least one course from this group must be above the introductory level.

Admission

For information concerning admission and enrollment for the freshman year, the attention of the student is directed to the sections on admission and selection of a major in the introductory portion of this catalog. He should also note any special requirements, if such are listed, above the Schedule of Studies for the curriculum in which he is interested.

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, three semesters of algebra, one semester of plane geometry, one semester of trigonometry, and one year of physics. Lack of this background may lengthen the engineering program of study.

The Doctor of Philosophy in Engineering Science

The College of Engineering offers a program of study and research leading to the degree of Doctor of Philosophy in Engineering Science. The program is strongly research oriented with an interdepartmental course content in the following engineering science areas: Mechanics of Solids, Mechanics of Fluids, Transfer and Rate Processes, Thermodynamics, Electrical Sciences, and Nature and Properties of Materials (Materials Science). Admission is open to qualified students with a recognized degree in engineering, mathematics, a physical science, or a biological science. This program should be of special interest to those who plan to teach and do research in engineering schools.

Research projects may be undertaken in Hydraulics, Hydrology, Fluid Mechanics, M-

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

**Degrees**

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

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Engineering, Building Theory and Practice, Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Science, Mechanical Engineering, Mining Engineering, Physical Metallurgy.</td>
</tr>
<tr>
<td>Bachelor of Architecture</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Science, Hydraulic Engineering, Materials Science, Mechanical Engineering, Nuclear Technology, Sanitary Engineering, Structural Engineering</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Engineering Science</td>
</tr>
</tbody>
</table>

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**General Extension Service**

Norman Braden, Director

The General Extension Service is devoted to the education of individual off-campus students and to the improvement of educational opportunities for community groups. Its mission is to extend the resources of Washington State University to individuals and groups within the state. These resources are to be found in the faculty and the library of the institution.

The services of the General Extension Service may be grouped under three main headings.

**Extension Classes**

Classes are offered, usually in the evenings, both with and without university credit in eastern Washington. For many years the university has conducted an established class program in Spokane. There, in addition to the usual academic courses, the General Extension Service has cooperated with the Fine Arts Department in the operation of the Spokane Art Center.

A group of persons desiring college-level instruction may request the General Extension Service to offer a course in their community. If there is a sufficiently large number to support the requested course, and if a qualified instructor is available, the class may be established. Usually an enrollment of twenty-five to thirty students is required. Evening extension classes usually meet once or twice a week, depending on the number of contact hours required by the course and the convenience of the students. Most courses giving university credit will meet for a period of sixteen weeks.

Credit for university courses offered by the General Extension Service is extension credit—not residence credit. Extension courses, when offered for credit, are designed to provide the
same level of instruction and to be equivalent to similar courses taught on campus. It is apparent, however, that in two respects extension work will differ from resident study: the extension student is not required to be admitted to Washington State, nor are all the resources of the institution available to the student.

The General Extension Service is authorized to offer any course found in the departmental listings in this catalog, provided the appropriate facilities and teaching staff are available. The amount of extension class credit applicable to a baccalaureate degree program is limited by the residence requirement of the university and the specific course requirements of the various degree curricula. Theoretically it is possible for a student, by extension class work only, to complete three years of college work. Actually this is possible only in a small number of individual cases, as junior- and senior-level courses are usually offered in only a few subject-matter areas.

**Correspondence Courses**

Seventeen teaching departments offer about 100 courses by correspondence, on both high school and university levels, without regard to the location of the students. A Correspondence Course Catalog is published annually and may be obtained by writing to the Director's office.

Correspondence course credit applicable to a baccalaureate degree program at Washington State University is limited to 25 per cent of the total number of credits required for the degree.

A maximum of 8 semester hours of the fifth year of study for the Standard Certificate may be taken by correspondence study or extension class work.

**Informal Adult Education**

Institutes, conferences, workshops, and short courses dealing with specific topics are arranged both on and off campus. Faculty members are available to serve as consultants in a wide variety of situations.

Offices of the General Extension Service are located as follows:

- On Campus—Director's Office, General Extension Building
- In Spokane—Spokane Center, South 10 Cedar Street

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The Graduate School
James N. Pitts, 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 num-
ous, and the student who contemplates graduate study should select a graduate school that offers a superior program in his chosen field. He 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.

The prospective graduate student should prepare himself adequately, both in the fundamental subject matter necessary for his advanced work and in the other branches of learning, so that he may intelligently fulfill the responsibilities of leadership and service.

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 doctoral degree is awarded in recognition of the candidate's scholarship. The 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. This is true at Washington State University. It is recognized also that many who earn advanced degrees 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.

**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 Committee on Graduate Studies.

The Graduate Faculty consists of the President of Washington State University, the deans of the various academic units, the chairmen of the academic departments in which advanced-degree programs are offered, and members of the faculty elected by the Committee on Graduate Studies. 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 Committee on Graduate Studies. Graduate students have opportunities for studying and working with the members of the Graduate Faculty, who have been selected because of their special competence and interest in an intimate professional relationship.

**Degrees Granted**

**Doctor of Philosophy**

Programs leading to this degree are available in the following fields of study: agricultural economics, agronomy, American studies, animal sciences, anthropology, bacteriology, biochemistry, botany, chemical physics, chemistry, computer science, economics, education, engineering science, English, entomology, food science, genetics, geology, history, horticulture, literary studies, mathematics, nutrition, pharmaceutical science, physical education, physics, plant pathology, political science, psychology, sociology, soils, speech, veterinary science, zoology, and zoophysics.

**Master of Arts and Master of Science**

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

**Other Degrees**

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

A student may undertake a program for the Master of Fine Arts degree, the Master of Business Administration degree, or the Master of Extension degree.

Programs of study leading to the Master of Arts in Teaching (M.A.T.) degrees are offered for teachers in most teaching majors as listed under the Department of Education.
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 by 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 average (3.00) 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 average (3.00) in all approved, in-course 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. A foreign student who has undertaken graduate study in another institution will be accepted only after evaluation of his undergraduate study as well as his 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

Credits earned in other recognized graduate schools may be applied to a limited extent toward an advanced degree, if appropriate, as part of the student's program and representing work of acceptable quality (B average); however, they may not be substituted for residence requirements. For necessary interpretations, inquiries should be sent to the Dean of the Graduate School.

Work in Summer Sessions

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

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

Graduate Work by Extension

Subject to certain limitations, work done in extension classes of Washington State University may be accepted in partial fulfillment of requirements for advanced degrees if approved by the chairman of the major department and the Director of the General Extension Service.

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.

Work Done by Seniors

A last-semester senior who has at least a 2.75 grade-point average in the last half of his undergraduate work may register for work in the Graduate School in excess of that required to complete the bachelor's degree with the approval of the Dean of the Graduate School. Such work may include 500-level courses. Work done by an undergraduate may under no other conditions be applied toward an advanced degree.

Seniors who wish to enroll in 500-level
Courses for undergraduate credit may do so with the approval of their department chairmen.

**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 enrollment of seven credits or more
2. Enrollment of six credits or less
3. No-credit enrollment

Enrollment in categories 1 or 2 automatically will grant no-credit enrollment for the ensuing two terms (semester or summer session) at no charge. Further no-credit enrollment may be granted for a fee of $5.00 per calendar year. No-credit enrollees who wish to enroll for credits must give the Admissions Office one month notice prior to the enrollment date. Graduate students who fail to maintain continuous enrollment will be dropped from the university. Reinstatement may be granted by the Dean of the Graduate School on recommendation of the department.

Special problems (599) and research, thesis, examination (600), and other work which may be so designated, shall have as prerequisite regular student status in the Graduate School. Research or special problems done on the in absentia basis must be accomplished without utilizing the facilities of Washington State University. Inquire at the registrar's Office concerning procedures for in absentia registration.

**Full Load**

A load of 12 hours or more per semester is considered a full load for a graduate student.

**Scholarship Standards**

A student must earn a B average for all in-course work, and separately for all upper-division and graduate course work, on a program for an advanced degree. No work of poorer quality or less may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C. Any course in which a grade of D or F is earned must be repeated.

Any graduate student who fails to maintain a cumulative grade point average of 2.75 or better for all of his in-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 chairman of the major department with the concurrence of the Dean of the Graduate School.

**Time Limit**

The time limit for the use of graduate credit 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.

**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 there are counseling assistants appointed each year. The Graduate Study Bulletin should be consulted concerning qualifications, eligibility, and application procedures.

Assistantship appointments permit students to carry part-time programs of study and require part-time service. Stipends vary according to the amount of required service, the extent of the student's training, and other factors. Graduate students appointed to assistantships by the Board of Regents are exempt from nonresident registration fees but are required to pay the resident registration fees. Forms for assistantship or fellowship applications may be obtained from the Graduate School.

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

For information about special scholarships and fellowships write to the Dean of the Graduate School or the chairman of the department concerned.
The College of Home Economics aims to prepare young people for professional careers and leadership in home economics at home and abroad. The emphasis in the College of Home Economics is the individual and the family. Students take work in the arts, humanities, and the natural and social sciences as a basis for professional courses. In the professional courses synthesis and application for appropriate disciplines are made of information relevant to problems and decisions of the individual and the family.

Transfer Students
Students who plan to transfer to Washington State University should concentrate on the General University Requirements during the freshman and sophomore years in order to have time to complete their professional courses in the last two years.

Departments and Areas
The College of Home Economics, located in White Hall, is staffed and equipped to offer instruction in three departments: Child and Family Studies; Clothing, Interior Design, and Textiles; Foods, Nutrition, and Institution Management. A student may select a major in home economics education, or in one of the three departments.

The home economics education curriculum is made up of courses in each of five areas of home economics plus courses in the Department of Education that meet certification requirements for provisional and vocational certification.

The laboratory facilities in the College of Home Economics have been undergoing constant improvement. A nursery school for children, ages three to five, is provided for the Department of Child and Family Studies. The foods and nutrition courses have classes in laboratories equipped and arranged for effective instruction. Use is made of the modern and adequate facilities available in residence halls on the campus for supplementing subject-matter offerings in institution management. Clothing classes are held in newly remodeled laboratories with individual work units comprised of sewing machine, cutting table, and pressing equipment. The textile laboratory provides equipment for textile analysis. Three interior design laboratories provide well-equipped areas for problems in design, fabric analysis, display, and the study of equipment.

Opportunities for Graduates
Courses in the College of Home Economics are designed to prepare students for positions in
Military Training

C. Clevenger, Coordinator, Military Affairs

General

Washington State University offers all eligible male students an opportunity to participate in the Senior Reserve Officer Training Corps (ROTC) program leading to commission as second lieutenant in either the Army or Air Force. The normal course of instruction covers four years of university attendance. A student may complete all requirements for a commission in two years by participating in an additional six-week summer camp prior to the start of his advanced (last two years) program.

Although pay, benefits, and accruals for officer-graduates in either service are similar, the methods, procedures, and programs established to obtain commission through the Senior ROTC programs of each service vary widely. Students contemplating enrollment in

degrees

The curricula listed in the College of Home 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 in Home Economics</td>
<td>Child and Family Studies; Clothing, Interior Design, and Textiles</td>
</tr>
<tr>
<td>Bachelor of Science in Home Economics</td>
<td>Clothing, Interior Design, and Textiles; Foods, Nutrition, and Institution Management; Home Economics Education</td>
</tr>
<tr>
<td>Bachelor of Arts in Interior Design</td>
<td>Clothing, Interior Design, and Textiles</td>
</tr>
<tr>
<td>Bachelor of Arts in Home Economics</td>
<td>Clothing, Interior Design, and Textiles; Home Economics</td>
</tr>
<tr>
<td>Bachelor of Arts in Child Development</td>
<td>Child and Family Studies</td>
</tr>
<tr>
<td>Bachelor of Arts in the Teaching of</td>
<td>Home Economics</td>
</tr>
<tr>
<td>Bachelor of Science in Home Economics</td>
<td>Foods, Nutrition, and Institution Management</td>
</tr>
<tr>
<td>Bachelor of Science in Food Science</td>
<td>Foods, Nutrition, and Institution Management</td>
</tr>
<tr>
<td>Bachelor of Science in Nutrition</td>
<td>Foods, Nutrition, and Institution Management</td>
</tr>
<tr>
<td>Doctor of Philosophy (Food Science)</td>
<td>Foods, Nutrition, and Institution Management</td>
</tr>
<tr>
<td>Doctor of Philosophy (Nutrition)</td>
<td>Foods, Nutrition, and Institution Management</td>
</tr>
</tbody>
</table>
either program should consult their faculty advisers and the chairmen of the military departments to determine the program suitable to their course of study and desired goals.

Each department has specific requirements for attending summer training periods conducted at active Army and Air Force installations in the United States. Approved university credit is granted for this participation if the student has registered in summer school. Students who attend this summer training receive military pay while in attendance, and a travel allowance is paid to and from the training site.

Both departments provide qualified and selected Advanced Course cadets, during their last year of enrollment, an opportunity to participate in a light-plane flight instruction program conducted at an airport near the campus by a licensed commercial operator. Successful completion of the program leads to the award of a private pilot license, as authorized by the Federal Aviation Agency. This program is provided without charge to the student.

Financial Assistance

Students who enroll in the Advanced Course receive pay of $50 per month.

For those students who apply and are selected, both military departments offer additional financial assistance, utilizing the Financial Assistance Program authority established under Title 10, U. S. Code, to aid the students while enrolled. This aid includes payment of tuition, fees, books, and special laboratory expenses. In order to qualify for this assistance, the candidate must apply early to the university and military department chairman of the service of his choice. The student who accepts this assistance incurs a four-year obligation of active duty as an officer. Only students enrolled in the four-year program are eligible for this assistance.

Administration

The government provides required military texts, equipment, and uniforms at no cost to the individual.

All members of the ROTC pay a special activity fee of $4.00 annually. This fee in part defrays expenses of extracurricular, social, and athletic activities in which cadets participate.

A student who accepts any financial assistance during enrollment in the program must enlist in a reserve component of the armed forces conducting the program in which he enrolls. If under 21 years of age, the member must have parental or guardian consent to participate in the Advanced Course.

Eligibility for enrollment in the basic program, for which no financial assistance is provided, is satisfied by the enrollee passing his university entrance physical examination and being an American citizen.

Selective Service regulations provide that students enrolled in ROTC may be deferred from induction.

Two-Year Program

An opportunity is provided for graduate students, transfer students, and those who did not take ROTC during their first two years to obtain a commission in two calendar years. To be eligible for this program a student must have at least two academic years remaining at the university.

This program requires six weeks' military training by the applicant prior to his initial enrollment in the Advanced Course. This training is conducted during the summer preceding the fall semester entrance date. It is conducted on an active Army or Air Force installation in the United States. While in attendance, the student receives military pay and is provided a travel allowance. University credit is available for summer camp attendance provided the student applies and registers for summer session credit.

To participate in the program, the student must initiate action through the Director of Admissions or the chairman of the ROTC department of his choice by February 1 preceding the fall semester entrance date.
College of Pharmacy

ellen L. White, 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 basic sciences and mathematics and is integrated with courses in the humanities and social sciences. The schedule of studies is a five-year program made up of one preprofessional year and four professional years. 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. Most pharmacists practice their profession in community retail pharmacies or in hospital pharmacies. Responsible positions are held by pharmacists in the manufacturing industry as production supervisors, medical service representatives, salesmen, and researchers; in government positions; in teaching; and in institution research.

Many women who are scientifically motivated and who seek a professional status have found that pharmacy provides a most rewarding career. They enjoy, as do the men, the intellectual challenge in keeping abreast with modern medical discoveries and the activities of the pharmacist that usually require continued association with the general public as well as with members of the other health professions.

Admission

A student may enroll in the prepharmacy program of study at Washington State University or at any other institution where equivalent courses may be taken. Those entering Washington State University as freshmen with an intent to major in pharmacy are advised to indicate this fact when enrolling as prepharmacy students in the Curriculum Advisory Program. Prepharmacy students are counseled and advised in their enrollment by members of the pharmacy faculty.

Upon completion of the preprofessional year, a student may apply for admission to the College of Pharmacy. Candidates for certification from the prepharmacy program at Washington State University into the professional years in the College of Pharmacy must have completed successfully the courses listed in the prepharmacy year, and have at least a 2.00 grade point average. Also, the grade point average made in the biological and physical sciences and mathematics must be at least 2.00.

In special cases, a student who completes, with a superior record, all of the nonprofessional courses in the first professional year as well as those of the prepharmacy year may be admitted directly into the second year of professional study. Arrangements may be made to make up the professional course deficiency. A minimum of three years' enrollment in an accredited school of pharmacy is required for graduation.
A personal interview with a member of the pharmacy faculty, or a designated representative, is required of all students before admission is certified. Arrangements for interviews are made by the Office of the Dean of the College of Pharmacy.

Transfer Students
Students planning to transfer prepharmacy credits from another institution may obtain information regarding their acceptability from the Office of Admissions. Determination of admission to the College of Pharmacy will be based upon the total evidence required, including the academic record, test results, recommendations, and a personal interview. A student may transfer from another accredited pharmacy school with advanced professional standing if he is in good standing at his previous school and has achieved an acceptable cumulative grade point average and at least a 2.00 grade point average in pharmacy subjects. In addition, he must present a letter of recommendation from the dean of that pharmacy school.

Degrees
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.

The College of Pharmacy offers programs of study leading to the degrees of Bachelor of Pharmacy, Master of Science in Pharmaceutical Science, and Doctor of Philosophy (Pharmaceutical Science).

College of Sciences and Arts

Herbert J. Wood, Acting Senior Dean, Division of Humanities and Social Sciences
B. R. Ray, Dean, Division of Sciences

The College of Sciences and Arts has several major responsibilities.

As a bearer of the tradition of liberal education, this college 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. A student is 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 value 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 the departments of this college.

Students who plan to do advanced work beyond the bachelor's degree should plan their programs so as to meet the requirements for admission to a graduate school.

The college has the responsibility to provide the 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.

The College of Sciences and Arts offers a number of curricula to give preprofessional training to students who then will enter professional schools. At the same time these curricula are designed to provide a basic liberal education.

Washington State University is on the approved list of the American Chemical Society. The graduate training program in clinical psychology is accredited by the American Psychological Association.

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

Admission

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

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

Requirements for Graduation

The requirements for graduation of the College of Sciences and Arts include the General University Requirements for Graduation, but are somewhat greater in the humanities, social sciences, and sciences. See under General University Requirements for Graduation.

Departments and Programs

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

The Division of Humanities and Social Sciences includes:

Anthropology, black studies, communications, English, fine arts, foreign languages, history, music, nursing, philosophy, police science and administration, political science, psychology, sociology, and speech. In addition, several special curricula are offered and are listed alphabetically in this catalog as follows: American studies, general studies (humanities, social sciences, liberal arts, linguistics), and prelaw.

The Division of Sciences includes:

Bacteriology and public health, botany, chemistry (including biochemistry), computer science, general biology, genetics, geology, mathematics, physics, and zoology (including physiology and wildlife biology). In addition, several special curricula are offered: general studies (physical sciences, biological science, mathematics), biophysics, biochemistry, chemical physics, environmental science, nuclear technology, conservation, and genetics. The last four are offered jointly with other colleges of the university.
# Degrees

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

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts</td>
<td><em>(Awarded in the General Studies Program)</em></td>
</tr>
<tr>
<td>Bachelor of Arts</td>
<td>Anthropology, Black Studies, Communications, English, Fine Arts, Foreign Languages, History, Mathematics, Music, Philosophy, Political Science, Social Studies, Sociology, Speech</td>
</tr>
<tr>
<td>Bachelor of Music</td>
<td>Music</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td><em>(Awarded in the General Studies Program)</em></td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Bacteriology and Public Health, Biochemistry, Botany, Chemistry, Environmental Science, Geology, Nursing, Physics, Police Science and Administration, Psychology, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Anthropology, English, Foreign Languages, History, Mathematics, Music, Philosophy, Police Science and Administration, Political Science, Sociology, Speech</td>
</tr>
<tr>
<td>Master of Arts in the Teaching of</td>
<td>Biological Science, Chemistry, English, Fine Arts, Mathematics, Music, Physical Science, Physics, Social Studies, Speech</td>
</tr>
<tr>
<td>Master of Fine Arts</td>
<td>Fine Arts</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Bacteriology and Public Health, Botany, Chemistry, Computer Science, Environmental Science, Genetics, Geology, Physics, Psychology, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>American Studies, Anthropology, Bacteriology, Biochemistry, Botany, Chemical Physics, Chemistry, Computer Science, English, Genetics, Geology, History, Literary Studies, Mathematics, Physics, Political Science, Psychology, Sociology, Speech, Zoology, Zoophysiology</td>
</tr>
</tbody>
</table>
The curriculum of the College of Veterinary Medicine is designed to train students to fill positions in the many fields of activity in the veterinary profession, e.g., private practice, U. S. Public Health Service, federal and state disease regulatory programs, teaching, research, and as commissioned officers in the Air Force and Army Veterinary Corps.

The College of Veterinary Medicine at Washington State University is accredited by the American Veterinary Medical Association.

Admission

At least six years and one six-week summer session are required to obtain a degree in veterinary medicine. The first two years of pre-veterinary study can be taken at any institution having courses equivalent to those taught at Washington State University. The last four years and the summer session are professional study and are conducted by the College of Veterinary Medicine. Attendance at the six-week session is required between the third and fourth years of professional study.

Applicants for admission to the College of Veterinary Medicine should present at least 60 semester hours of acceptable credit from a recognized college or university, exclusive of military training and physical education. The 60 semester hours must include courses that will meet the General University Requirements for Graduation: 12 hours social science and humanities electives; English composition; 21-31 hours in physical and biological sciences including zoology, chemistry, physics, and mathematics; 14-24 hours recommended electives; 4 semesters of physical education activity. Details of this program are listed in the departmental section of this catalog under Veterinary
Information regarding the acceptability of course credits should be obtained from the Director of Admissions.

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

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

Students seeking to enter the four-year professional course must fill out an Application for Admission with Advanced Standing, as well as an Application for Admission to the College of Veterinary Medicine, both of which can be obtained from and should be returned to the Director of Admissions. These and all official transcripts of the applicant's credits should be filed with the Director of Admissions between December 1 and March 1 preceding the fall semester in which the applicant wishes to enroll. A transcript of the spring semester's credits must be in the Director of Admissions Office before July 1. The records of all qualified applicants are submitted by the Director of Admissions to the Veterinary Medicine Committee on Admissions. The committee with the approval of the Board of Regents selects those students to be admitted to the first year of the professional course. Applicants will be notified as to whether or not they are accepted. Unsuccessful applicants who wish to be considered the next year must present new applications.

In accordance with policies adopted by the Board of Regents, preference for admission to the College of Veterinary Medicine is as follows:

1. To qualified students coming from homes in the state of Washington.
2. To qualified students certified and financed by compact states.
3. To qualified students who cannot be financed by their home states.

Western Regional Higher Education Compact

The legislature of the state of Washington has authorized the Boards of Regents of institutions of higher learning to enter into contractual agreements with member states of the Western Interstate Commission for Higher Education. The states are: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

The Western Interstate Commission may enter into contractual agreements with the governing authority of any educational institution in the region upon terms and conditions to be agreed upon between contracting parties. To date Washington State University has made agreements with several states of the region to provide professional education in veterinary medicine.

For additional detailed information, please contact your preveterinary medicine adviser, your state commission, or the office of: The Executive Director, Western Interstate Commission for Higher Education, University East Campus, 30th Street, Boulder, Colorado 80302.

Fees

Students enrolled in the College of Veterinary Medicine pay a special fee of $100 per semester in addition to regular registration fees.

Degrees

Some students may elect to complete three years of course work before entering the professional curriculum. It is possible for these students to apply credit for courses taken during the preveterinary curriculum and the first year of the veterinary curriculum on a bachelor of science degree. Preveterinary students who wish eventually to qualify for this degree should consult with advisers in departments of related fields or with the Coordinator of General Studies regarding graduation requirements.

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Master of Science in Veterinary Science, and Doctor of Philosophy (Veterinary Science).
Description of Courses
Description of Courses

Department of Aerospace Studies

Professor and Chairman of Department, Colonel F. N. Stahl; Assistant Professors, Major, F. J. Ruff, Captains, K. B. Dockter, R. T. Dorr.

The curriculum is designed to provide education that will develop skills and attitudes which are vital to the professional Air Force officer. The program qualifies men for commissions in the Air Force Officer Corps. The goal of the academic and laboratory activities is to insure an output of well-trained, vigorous, and capable junior officers.

The college man who successfully completes his chosen field of study and gains his commission through the Air Force ROTC program is assured of a military career which will prove to be challenging, exciting, and satisfying. All successful candidates receive Air Force Reserve commissions and are eligible for selection and appointment in the Regular Air Force. Each officer is assigned to a duty paralleling his professional field of study. Nearly every field of endeavor is utilized in today’s complex Air Force, and progress and advancement are unlimited for the capable and energetic officer.

Classes are conducted as seminar-type discussion groups. Subject matter is researched and evidence is critically analyzed with a view toward establishing a basis for independent evaluation commensurate with the level of individual ability. Frequent personal instructor-student contacts are required. Extensive subject-area reading is assigned.

Special functions providing added experiences are available on an elective basis. These activities include Air Force installation visits, observation, and detailed examination of weapons, missiles, and aircraft. Students who successfully complete the flight instruction program go into Air Force pilot training upon reporting for active duty.

Eligibility for Participation

A candidate for commission in the Air Force must be a citizen of the United States, meet established physical and mental standards for which special tests are given, and have high moral character. He must be of an age to complete the program prior to reaching his 28th birthday. He must also express a willingness to pursue the program to completion and accept a commission upon graduation.

For additional information refer to Military Training in the general information section of this catalog.

Description of Courses

For explanation see Index under “Symbols”

General Military Education

Aero

201 World Military Systems 2 I U.S. general purpose forces, aerospace support forces, and the Air Force officer.
250 Field Training Course 4 S Prereq 2 yrs college work and acceptance by department. Application must be made not less than four months prior to attendance date. Successful completion of this course meets prerequisite to enroll in the Professional Officer Education Program (Aero 301). Intensified six weeks of academic and field exercises at an active Air Force installation establishing basic military concepts.

Professional Officer Education

Aero

301 Growth and Development of Aerospace Power 3 (3-1) I Prereq Aero 101, 201, or 250. Communicative skills; growth and development of airpower; its concepts, doctrines, and employment.
302 Growth and Development of Aerospace Power 3 (3-1) II Prereq Aero 301. Past and present astronautic and space operations; probable future patterns in international aerospace power development.
Department of Agricultural Economics

401 The Professional Officer 3 (3-1) I Prereq Aero 302. Professional leadership, responsibilities, and functions required of career Air Force officers; military justice system.

402 The Professional Officer 3 (3-1) II Prereq Aero 401. Management principles and functions pertaining to command and supervision; case histories and case studies.

490 Summer Training Unit 4 S Prereq Aero 301 or 302. A four-week summer exercise developing concepts, observing air base activities, and participating in familiarization flying.

Department of Agricultural Economics


Agricultural economics is frequently referred to as the business side of agriculture. In agricultural economics courses, students learn to use economics 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, agricultural marketing, and quantitative methods.

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. They find a wide variety of career opportunities such as farm operators, professional farm or agribusiness managers, county agricultural agents, agricultural representatives for financial institutions, market analysts, field representatives for agribusiness firms, economists for state and federal agencies, and foreign agricultural specialists. An increasing number of students are taking graduate work to broaden their career opportunities.

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

Description of Courses

Ag Ec 101 Economic Organization of Agriculture
The place and role of agriculture in the economy; problems in planning for production and marketing of agriculture's output.

201 Economics for Management in Agriculture
General introduction to economics appropriate for managing firms in the agricultural economy.

301 Structure and History of the American Agricultural Economy
3 II Prereq 1 course in Ag Ec or Econ. Agriculture in evolution toward a modern economy; organizational nature of firms, land settlement, and farmer participation in national affairs.

340 Farm Management 3 I Prereq Ag Ec or Econ 201, Econ 201 or 203. Appraisal, organization, and management of selected types of farms and ranches.

350 Agricultural Supply and Marketing
Business I: Internal Management Problems
III Prereq Ag Ec 201, Econ 201 or 203; B A 230. Product combinations, resource allocations, personnel, finance, and related problems in the operation of agri-business firms.

351 Agricultural Supply and Marketing
Business II: Competitive Strategies
III Prereq Ag Ec 201, Econ 201 or 203; B A 230. Alternatives in the market behavior of firms that handle, process, and trade in agricultural inputs and outputs.

370 Agricultural Prices 3 I Prereq Ag Ec 201, Econ 201 or 203; Biol 310 or B A 315. Factors determining levels and movements of prices of agricultural commodities.
410 Quantitative Methods in Agricultural Economics 3 I Prereq Math 201, 202; Biom 310. Quantitative methods used by agricultural economists, including linear programming, multiple correlation, and time series.

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

430 Financial Arrangements in Agriculture 3 I Prereq Ag Ec 201, Econ 201 or 203. Personal and business finance in the agricultural economy; insurance, retirement, amortization, and interest.

440 Advanced Farm Management 3 II Prereq Ag Ec 370 or Econ 301; Math 201, 202. Economic principles applied to organization and operation of farms and ranches.

450 Agricultural Marketing 3 II Prereq Ag Ec 370 or Econ 301; Math 201, 202. Institutions, practices, policies, and problems in agricultural input and output marketing.

460 Cooperatives 3 II Prereq 300-level course in Ag Ec. History, principles, kinds, problems, organization, and operations of agricultural cooperatives; emphasis on Washington conditions.

480 Resource Economics 3 I Prereq Ag Ec 370 or Econ 301. Economic principles applied to problems of natural resource utilization, development, and conservation.

490 Agricultural Policy 3 I Prereq Ag Ec 370 or Econ 301. Public policy issues related to commercial agriculture and rural areas.

498 Seminar 1 May be repeated for credit. I Prereq senior standing. Current problems.

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

501 Research Methods in Agricultural Economics 3 I Problem delineation, hypothesis formation, and testing.

502 Seminar in Advanced Topics 3 May be repeated for credit. I The relevance of current developments in economic theory to issues in agriculture and resource policy.

510 Agricultural Statistics 3 II 1971-72 a/y. Advanced statistical research techniques used in agriculture.

511 Matrix Research Techniques 3 II 1970-71 a/y. Various forms of matrix techniques such as programming and input-output analysis in research in agricultural economics.

520 Economic Development and Trade in Agriculture 3 II 1971-72 a/y. Nature and roles of agricultural development and trade; concepts of sectors, regions, and interregional relationships.

521 Seminar in Agricultural Development 1 I Current topics on the processes and meaning of agricultural development.

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

541 Seminar in Management Concepts 1 II Current topics in managerial concepts and processes applicable to the agricultural sector.

550 Market Organization and Structure 3 I Agricultural input and output marketing systems from the standpoints of market structure, conduct, and performance.

551 Seminar in Agricultural Marketing and Prices 1 I Current thought on the structure and efficiency of agricultural marketing and pricing systems.

570 Advanced Agricultural Prices 3 II 1970-71 a/y. Agricultural price relationships, their function, analysis, and forecasting in the light of value and monetary theory.


590 Public Policy and Agriculture 3 II 1971-72 a/y. Agriculture’s role in public economic policy.

591 Seminar in Agricultural Policy 1 II Basic and current topics relating public welfare and problems to the agricultural sector.

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

600 Research, Thesis, 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 degrees. The student should consult his adviser for the appropriate sequencing of courses as well as for the selection of electives that best suit his needs and interests. Illustrative programs are available from the department.

BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS

Major in Agricultural Economics

At least 21 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

This curriculum, leading to the Bachelor of Science degree in Agriculture, 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.

This program of study requires no mathematics beyond intermediate algebra. This requirement may be met by taking Math 101c from WSU, transferring equivalent credit, or having a satisfactory Washington Pre-College Mathematics Test score.

**Hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 101 or 201, 9 hours from 300-level courses, and 6 hours from 400-level courses</td>
<td>18</td>
</tr>
<tr>
<td>Stat Elective</td>
<td>3</td>
</tr>
<tr>
<td>B A 230 and Elective</td>
<td>7</td>
</tr>
<tr>
<td>Econ 102, 203, 301, and 320 or 340</td>
<td>12</td>
</tr>
<tr>
<td>Ag Elective excluding Ag Ec</td>
<td>12</td>
</tr>
<tr>
<td>Engl 101 and 201 or 301, Spe Elective, and Com, Engl, or Spe Elective</td>
<td>12</td>
</tr>
<tr>
<td>Hum and Soc S (9 hours must be 200-level or above)</td>
<td>15</td>
</tr>
<tr>
<td>Bio S and Ph S (General University Requirements)</td>
<td>12</td>
</tr>
<tr>
<td>Phil 201 or Math 107, or Spe 231</td>
<td>3</td>
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<tr>
<td>P E</td>
<td>2</td>
</tr>
<tr>
<td>Electives</td>
<td>26</td>
</tr>
</tbody>
</table>

* May not include Econ.

Management Curriculum

This option, leading to the Bachelor of Science degree in Agricultural Economics, 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.

**Hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours from Ag Ec 340, 350, 351, 6 hours from Ag Ec 410, 430, 440, 450, and 9 hours from 300-level or above</td>
<td>21</td>
</tr>
<tr>
<td>B A 315 or Math 360; Stat or Cpt S Elective</td>
<td>5</td>
</tr>
<tr>
<td>B A 210, 230, 231, 333 or 338 Econ 102, 203, 301, 320 or 340 Ag Elective excluding Ag Ec Engl 101 and 201 or 301, Spe Elective, and Com, Engl, or Spe Elective Hum and Soc S (One from Soc 343, Psych 201, 306, or 390 and 3 hours of 200-level or above)</td>
<td>12</td>
</tr>
<tr>
<td>Bio S and Ph S Elective</td>
<td>9</td>
</tr>
<tr>
<td>Math 201 and 202</td>
<td>6</td>
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<td>P E</td>
<td>2</td>
</tr>
<tr>
<td>Electives</td>
<td>18</td>
</tr>
</tbody>
</table>

* May not include Econ.

General Curriculum

This option, leading to the Bachelor of Science degree in Agricultural Economics, 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.

**Hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 350 or 351, 340 or 440, 450 or 460, 370 or 410, 430 or B A 425, 3 hours from Ag Ec 301, 420, 480, 490, and 3 hours from 300-level or above</td>
<td>21</td>
</tr>
</tbody>
</table>
B A 315 or Math 360; Stat or Cpt S 5
Elective
B A 230 Prin of Acctg 4
Econ 102, 203, 301, 320 or 340, 401 or 402 15
Ag Elective excluding Ag Ec 12
Engl 101 and 201 or 301, Spec Elective and Com or Engl or Special Elective 12
Hum and Soc S (12 hours must be 200-level or above)* 18
Bio S and Ph S Elective 9
Math 201 and 202 6
P E 2
Electives 18

* May not include Econ.

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, English, and 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

A student who plans to do work in agricultural economics beyond the bachelor’s degree should consult his adviser as early as possible to develop a study program directed toward his goal.

Agricultural Education

Professor C. O. Loreen; Assistant Professors, K. E. Fiscus, J. M. Wood.

Students who wish to qualify as teachers of vocational agriculture in high schools may do so by meeting the General University Requirements and the following general requirements for a teaching certificate in vocational agriculture: a Bachelor of Science degree in Agriculture or Agricultural Education; fulfillment of the requirements in professional education; completion of 142 semester hours.

Before the end of his sophomore year the student should be certified in agricultural education. He must have a 2.00 grade point average and meet the requirements for admission to the Department of Education.

Upon completion of the requirements for the major in general agriculture, the degree of Bachelor of Science in Agriculture is granted. Additional work may be devoted to the completion of other requirements for certification for teaching and advanced degrees.

This course of study leads to the degree of Bachelor of Science in Agriculture at the end of the fourth year; the Bachelor of Science degree in Agricultural Education and the Provisional Certificate at the end of the fifth year (see Department of Education).

The holder of the degree of Bachelor of Science in Agriculture or in Agricultural Education may be granted the degree of Master of Science in Vocational Technical Education upon the completion of an approved program of graduate study, provided he has had a year of successful teaching experience.

Schedule of Studies

At least 18 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

Freshman Year

**First Semester**  **Hours**
Engl 101 or Math Elective 3
Agron 101 Field Crops 3
A S 101 Animal Science 3
Bio S Elective 4
ROTC or Elective 2
P E 1/2

**Second Semester**  **Hours**
Hort 101 General 3
Ag M 201 Metals Shop 3
Math Elective or Engl 101 3
Bio S Elective 4
ROTC or Elective 2
P E 1/2

Sophomore Year

**First Semester**  **Hours**
Chem 101 Introductory 4
Econ 201 Principles 4
Psych 101 or Spe 112 3
Agron 201 Crop Sci 2
ROTC or Elective 2
P E 1/2

**Second Semester**  **Hours**
Chem 102 Introductory 4
Spe 112 or Psych 101 3
Educ 101 Introduction 2
A S 204 General Pou Sci 3
Ag M 203 Ag Bldg Construction 3
ROTC or Elective 2
P E 1/2
Department of Agricultural Engineering

Professor and Chairman of the Department, J. Roberts; Professor, M. C. Jensen; Associate Professors, D. L. Bassett, J. E. George, A. E. Powell; Assistant Professors, C. C. Mueller, C. L. Peterson, C. A. Pettibone, J. B. Simpson.

Agricultural Engineering

Agricultural engineering is the application of engineering science to agriculture. The field includes production, machinery, soil and water, electric power and processing, and farm structures. Graduates in this field normally find employment in research, teaching, development and promotional work, and advertising with commercial companies; in consulting business; or in farming. The curriculum includes basic courses common to other engineering curricula and courses in agricultural engineering.

The department offers courses of study leading to the degrees of Bachelor of Science in Agricultural Engineering and Master of Science in Agricultural Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy (Engineering Science).

Description of Courses

Ag E For explanation see Index under "Symbols"

110 Engineering Orientation 1 (0-3) I For freshmen only. Activities, employment, professional ideals, and ethics in engineering.

154 Introduction to Agricultural Engineering 1 (6-3) II Fields of agricultural engineering.

253 Creative Engineering 1 (0-3) I Prereq Ag E 110, 154. Engineering imagination, origin and development of design ideas, and conversion of ideas to meaningful reality.

254 Agricultural Engineering Analysis 1 (6-3) II Prereq Cpt S 201, Math 273 or c/. Mathematical description of physical and biological systems and their analysis by analog and digital methods.

361 Principles of Farm Machinery 3 (2-3) I Prereq C E 212. Operation, functional requirements, power and motion transmission, and force analysis of power machinery.

Preparation for Graduate Study

As preparation for an advanced degree in agricultural education or vocational technical education a student should have completed an acceptable teacher-training program.
Department of Agricultural Engineering

Schedule of Studies

At least 44 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Participation in the senior inspection trip is a requirement for graduation.

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag E 110 Orientation</td>
<td>1</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 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag E 154 Introduction</td>
</tr>
<tr>
<td>Math 172 Calculus II</td>
</tr>
<tr>
<td>Phys 201 Classical Physics</td>
</tr>
<tr>
<td>C E 101 Surveying</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td>ROTC or Elective</td>
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<tr>
<td>P E</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>Ag E 253 Creative Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Math 220 Intro Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Phys 202 Classical Physics</td>
<td>4</td>
</tr>
<tr>
<td>C E 211 Statics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 102 Fundamentals</td>
<td>3</td>
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<tr>
<td>Bio S Elective</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag E 254 Ag Engr Analysis</td>
</tr>
<tr>
<td>Math 273 Calc and Diff Equations</td>
</tr>
<tr>
<td>Econ 203 Fundamentals</td>
</tr>
<tr>
<td>C E 212 Dynamics</td>
</tr>
<tr>
<td>Soils 201 Soils</td>
</tr>
<tr>
<td>Cpt S 201 Comp Prog</td>
</tr>
<tr>
<td>ROTC or Elective</td>
</tr>
<tr>
<td>P E</td>
</tr>
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</table>

Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>C E 314 Mech of Materials</td>
<td>3</td>
</tr>
<tr>
<td>C E 315 Mech of Fluids</td>
<td>3</td>
</tr>
<tr>
<td>M E 301 Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Ag E 361 Prin of Farm Mach</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Ag E 362 Intern Combust Engines</td>
</tr>
<tr>
<td>E E 261 E E Science</td>
</tr>
<tr>
<td>E E 262 E E Lab</td>
</tr>
<tr>
<td>Ag E 393 Conserv Engr</td>
</tr>
<tr>
<td>Spe 112 Fundamentals</td>
</tr>
<tr>
<td>Elective</td>
</tr>
</tbody>
</table>
Senior Year

**First Semester**
- Ag E 491 Irrigation Engr 3
- Ag E 451 Seminar 1
- C E 330 Mech Struct 5
- Hum or Soc S Elective 3
- Engr or Science Elective 3

**Second Semester**
- Ag E 484 Electric Power 3
- Ag E 485 Processing 3
- Ag E 471 Farm Structures 4
- Approved Elective 3
- Engr or Science Elective 3

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

**Agricultural Mechanization**
The Department of Agricultural Engineering prepares students in agricultural mechanization for modern and mechanized farming and for sales and promotional work in agricultural communities. Emphasis is placed on the practical application of engineering methods to agriculture.

The department offers a course of study leading to the degree of Bachelor of Science in Agricultural Mechanization.

**Description of Courses**

**Ag M** For explanation see Index under "Symbols"

**110 Orientation** (0-3) Agricultural mechanization and its relation to other agricultural professions, ethics, and skills for analyzing, solving, and presenting mechanization problems.

**201 Metals Shop Practices** 3 (1-6) Theory, application, and practices of welding, machining, and associated skills in using metals.

**203 Agricultural Building Construction** 3 (1-6) Principles and practices in farm building construction including foundations, frames, materials, and tools; full-scale construction experience.

**210 Agricultural Mechanics** 3 II Prereq Math 101c. Theory of agricultural mechanics, including elements of basic physics, the energy concept, angles, and distance.

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

**312** (212) Engines and Tractors (2-3) I Prereq junior standing. Principles of engine operation, fuels, combustion, efficiency, power transmission, energy conversion, power measurement; tractor safety and costs.

**313** Small Engine Repair (0-3) I Prereq Ag M 312. The repair, adjustment, protective maintenance, operation, and safety of the small gasoline engine.

**321** (221) Agricultural Building Design 3 (2-3) II Prereq Ag M 203. Building location and layout; design of structural members and connections; heat and moisture relationships; ventilation.

**331** Agricultural Electrification 3 (2-3) II Prereq junior standing. Basic electricity, wiring, and electrical applications in agricultural production.

**344** Irrigation and Drainage 3 (2-3) I Prereq Math 101c; Soils 201. Principles of irrigation; water measurement; irrigation methods and practices; elementary irrigation system design. Field trip required.

**403** Agricultural Processing 3 (2-3) II Same as F S 403.

**451** Seminar 1 May be repeated for credit. I Same as Ag E 451.

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

**Schedule of Studies**

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Participation in the senior inspection trip is a requirement for graduation.

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 201 Metals Shop</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 110 Orientation</td>
<td>1</td>
</tr>
<tr>
<td>Chem 101 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 203 Ag Bldg Constr</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Spe 112 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Bio S Elective</td>
<td>4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Department of Agronomy

First Semester

Ag M 211 Ag Machinery 3
Engl 201 Intermediate Comp 3
Phys or Chem Elective 4
Bio S Elective 4
ROTC or Elective 2
P E 1/2

Second Semester

Ag M 210 Ag Mechanics 3
B A 210 Business Law 3
Econ 201 Fundamentals 4
Ag Elective 3
Hum or Soc S Elective 3
ROTC or Elective 2
P E 1/2

Junior Year

First Semester

Biom 310 Ag Statistics 3
Ag M 312 Engines and Tractors 3
Soils 201 Soils 3
Ag Ec 201 Econ for Management 3
Ag Elective 3

Second Semester

Ag Ec 340 Farm Management 3
Ag M 321 Ag Buildings 3
Ag M 331 Ag Electrification 3
Elective 3
B A 230 Accounting 4

Senior Year

First Semester

Ag Ec 350 or B A 360 3
Ag M 344 Irrig and Drain 3
Ag M 451 Seminar 1
Ag Elective 3
Elective 6

Second Semester

Ag M 403 Ag Processing 3
Engl, Spec, or Com Elective 3
Ag Elective 3
Elective 6

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

Department of Agronomy

Professor and Chairman of the Department, C. D. Moodie.


The Department of Agronomy offers courses of study in two major fields—agronomy and soils. Students interested in this general area may register for either major and elect courses in the other.

Students are encouraged to participate as part-time employees on agronomic or soils research programs. Departmental scholarships are also available based on ability, need, and interest.

Graduates are qualified to engage in agribusiness, farm management, and for employment by government and commercial agencies in research and service positions. Positions are available in federal and state agencies such as Agricultural Experiment Stations, Agricultural Extension Services, State Departments of Agriculture, Agricultural Research Service, Natural Resources, and the Soil Conservation Service as well as in food processing companies, insurance agencies, and commercial concerns dealing with farm products, chemicals and seeds. Opportunities also exist for employment and further study in other countries.

The department offers courses of study leading to the degrees 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 (Agronomy, Soils).

Description of Courses

Agron For explanation see Index under "Symbols"

101 Introductory Field Crop Science 3 I
Principles of culture and adaptation of important field crops.
201 Crop Science Techniques 2 (0-6) I Prereq Agron 101 or c/. Practices and principles related to crop growth and development; identification of crops and grading principles.

202 Forage Crops 3 (2-3) II Prereq Bot 201 or Bio S 104. Establishment, maintenance, and improvement of pastures; adaptability and utilization.

203 Grain Crops 3 II Prereq Bot 201 or Bio S 104. Adaptation, production, and utilization of cereals and alternate crops.

301 Turfgrass Culture 2 II Principles of establishment and management of turf for lawns, playfields, parks, cemeteries, and golf courses.

305 Weeds 3 (2-3) I Prereq Bot 201 or Bio S 104. Principles of control; identification and economic significance.

310 Seed Quality 2 (1-3) I 1970-71 a/y. Prereq Bot 201 or Bio S 104. Principles of seed identification, physiology, and testing.

312 Seminar 1 May be repeated for credit. Prereq junior standing. Current literature and reports on research or special topics.

345 Plant Breeding 3 (2-3) II Same as Hort 345.

405 Seed Production and Processing 3 (2-3) I 1971-72 a/y. Prereq Bot 320. Principles of field production of seed, processes of separating seeds of different physical characteristics, and evaluation of seed quality.

411 Crop Ecology 3 I Prereq Agron 202, 203 or 305. Effects of environment, nutrition, and management on crop growth and development.

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


507 Physiology of Growth Regulation 3 (2-3) II 1971-72 a/y. Prereq Bot 320. Regulation of plant growth, tissue differentiation, and development by herbicides and auxins.

508 Seed Physiology 3 II 1970-71 a/y. Prereq Chem 364. Physiology of seed development; ecology, physiology, and biochemistry of germination; mechanisms of dormancy, inhibition, and stimulation; current topics in research.

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

512 Topics in Agronomy 2 II Concepts of plant breeding, seed physiology, and technology; crop physiology and management.

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

600 Research, Thesis, or Examination Variable credit.

## Schedule of Studies

At least 20 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>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 101c or 107</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 103 Introductory</td>
<td>3</td>
</tr>
<tr>
<td>Agron 101 Intr Field Crop Sci</td>
<td>2</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>1/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 101 or 105</td>
<td>4</td>
</tr>
<tr>
<td>Bot 201 Intermediate</td>
<td>4</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Spec Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 or Ag Ec 201</td>
<td>3-4</td>
</tr>
<tr>
<td>Chem 102 or 106</td>
<td>4</td>
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<td>Pl P 329 General</td>
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<tr>
<td>Agron 201 Crop Sci Tech</td>
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<td>ROTC or Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Chem 240 Organic</td>
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</tr>
<tr>
<td>Soils 201 Soils</td>
<td>3</td>
</tr>
<tr>
<td>Agron Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Junior Year

First Semester
- Bot 320 Plant Physiology: 3 hours
- Biom 310 Ag Statistics: 3 hours
- Soils 301 Soil Mgt: 2 hours
- Ag Elective: 3 hours
- Agron Elective: 3 hours

Second Semester
- Entom 340 Ag Entomology: 3 hours
- Com, Engl, or Spe Elective: 3 hours
- Soils 401 Soil Analysis: 3 hours
- B A 210 Law and Business: 3 hours
- Agron Elective: 3 hours

Senior Year

First Semester
- Agron 411 Crop Ecology: 3 hours
- Agron Elective: 3 hours
- Genet 301 Genetics: 3 hours
- Agron 312 Seminar: 1 hour
- Elective: 5 hours
- Ag Ec 340 Farm Mgt: 3 hours

Second Semester
- Agron 345 Plant Breeding: 3 hours
- Agron or Soils Elective: 3 hours
- Elective: 6 hours
- B A 230 Prin of Acctg: 3 hours

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

Programs in American Minority Studies

Professor and Acting Coordinator of American Minority Studies, Herbert J. Wood. Professor and Chairman of the Committee on American Minority Studies, Herbert J. Wood.

The initial role of the Committee on American Minority Studies will be developmental and will insure the orderly establishment of a broader curriculum in response to the needs of American minority groups. The post-developmental role is one of liaison, communication, and research.

Program in Black Studies

Assistant Professor and Director of the Program, Johnnetta B. Cole.

The Program in Black Studies deals with a body of knowledge on the history, psychology, economics, culture, and arts of black America. Students majoring in black studies and minor- ing in a second field could move professionally into graduate work in the social sciences, teaching, business, or the field of social work. Other students may use their undergraduate major in black studies in positions such as minority education, social work, and business.

For non-majors, the course offerings in this program would provide an opportunity to acquire knowledge about the black experience in America.

The course of study leads to the degree of Bachelor of Arts in Black Studies.

Description of Courses

Bl St For explanation see Index under "Symbols"

101 Introduction to Black America 3 I Survey of social issues concerning Black America.

102 The Arts of Black America 3 II Survey of the art, literature, and music of Black America.

320 Black Literature in America 3 III Same as Engl 320.

324 Black Politics 3 I 1971-72 a/y. Same as Pol S 324.

326 Afro-American Peoples 3 II Same as Anth 326.

345 Philosophical Concepts of Black Revolution 3 II Same as Phil 345.

370 [S] Afro-American History 3 Same as Hist 370.


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

480 The Sociology of Intergroup Relations 3 Same as Soc 480.

498 Seminar 2 May be repeated for credit.

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

580 Race and Minority Relations 3 Same as Soc 580.

Listed above are the initial course offerings leading to a degree in black studies. Other courses are being developed by departmental faculties to meet the needs of this expanding program.
Schedule of Studies

Students undertaking a major in black studies will develop, with the advice of the director, a major with a minimum of 24 hours of black studies courses and a supporting minor of at least 16 hours. Of these 40 hours at least 21 must be in upper-division courses.

A student interested in a minor in black studies may do so through the General Studies Program.

Students planning to transfer to this program should have completed all General University Requirements and as many credits as possible toward equivalent courses for a minor in black studies prior to the junior year. The professional Black Studies courses may be completed during the junior and senior years at WSU.

Preparation for Graduate Study

This program does not offer an advanced degree but students who have completed the undergraduate program may undertake work for advanced degrees through courses of study in related areas.

Program in American Studies

Professor and Chairman of the Program, D. H. Stratton; Advisers: Professor G. A. Frykman, History; Associate Professor C. E. Blackburn, English.

The interdisciplinary program for the degree of Doctor of Philosophy in American Studies is offered jointly by the Departments of English and History. It is coordinated by a committee made up of representatives from the two departments.

Each candidate concentrates upon either American history or American literature, minoriring in the field not chosen for the major. In addition a second minor, fitted to the needs of the individual student, is developed from the following disciplines: anthropology, economics, English literature, European history or literature, fine arts, geography, philosophy, political science, and sociology.

Students who plan to engage in this study should have a broad undergraduate education which includes a knowledge of one or more modern foreign languages. Candidates entering the program without previous graduate training will normally take a master's degree in American literature or American history.

Subject to a favorable evaluation of their aptitude, certain selected students may be authorized by the departments concerned to proceed directly to the Ph.D. without taking a master's degree. All other candidates must have attained the degree of Master of Arts in American Studies, English, or History or equivalent graduate study as determined by the chairman of the Program in American Studies.

Department of Animal Sciences


The department offers majors in animal production, animal nutrition, animal biology, and food science.

As animal technology has advanced, along with progressive mechanization and with expansion of research, a greater diversity of jobs has been created. Animal agriculture includes farming and ranching, and it has come to mean more because it embraces a host of other agricultural business areas. Graduates are trained to handle the complex jobs that are now a part of the broad field of animal agriculture, including graduate study and research. They may also select from a large number of positions with industrial and commercial firms closely related to farming.

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.

Description of Courses

For explanation see Index under "Symbols"

Animal Production

A S

101 Animal Sciences 3 (2-3) I A perspective or panorama of the field.

204 General Poultry Science 3 (2-3) II Prereq Chem 101; 4 hrs Bio S. Breeds, breeding, physiology, incubation, brood-
ing, nutrition, products technology, housing, equipment, and management.


206 Livestock Selection and Evaluation 2 (0-6) II Prereq A S 101. Breed characteristics; basic principles of livestock selection.


212 Dairy Cattle Type Evaluation 2 (1-3) II Anatomical and physiological relationship between form and function.

280 Cattle Breeds and Management Practices 2 (1-3) Prereq A S 101. Beef and dairy cattle breeds; identification, castration, dehorning, fitting and showing, records, and other management practices.

288 Horses and Horsemanship 3 (2-3) II History and evolution; development of breeds; principles of selection; care and handling of horses.

297 Advanced Livestock Selection and Evaluation 1 (0-5) or 2 (0-6) May be repeated for credit. I Prereq A S 206.

381 Commercial Poultry Operations 2 (1-3) II 1971-72 a/y. Prereq A S 204. Field observations of poultry farm operations, feed manufacturing, hatchery operations, marketing agencies, and poultry processing.

382 Beef Cattle Production 3 I Prereq A S 200, 280; Genet 301. Principles of breeding, feeding, management, and marketing of purebred and commercial beef cattle.


385 Sheep and Wool Production 3 (2-3) II Prereq A S 200; Genet 301. Principles of breeding, feeding, management, and marketing of sheep and wool.

387 Swine Production 3 (2-3) I Prereq A S 200; Genet 301. Principles of breeding, feeding, management, and marketing of swine.

388 Horse Production 2 I Prereq A S 200, 280; Genet 301. Principles of breeding, feeding, and management of horses.

Animal Nutrition

A S

200 Principles of Nutrition 3 I Prereq Chem 102; Bio S 103. Nutritive evaluation of foodstuffs and the use of nutrients by domestic farm animals.

313 Feeds and Feeding 3 II Prereq A S 200. Practices, requirements, and calculations of rations for farm animals.

404 Animal Nutrition 3 (2-3) I Prereq A S 200. Physiology of digestion, nutrient requirements, and metabolism deficiency signs; ration formulation and mixing; emphasis on monogastric animals.

410 Principles of Ruminant Nutrition 3 (2-3) I Prereq A S 200; Bact 201; Bio S 103. Anatomy, physiology, and biochemistry of ruminant nutrition.


502 Seminar in Nutrition 1 May be repeated for credit.

505 Experimental Nutrition 3 (1-6) I 1971-72 a/y. Prereq A S 404 or 410; Chem 217. Research methods in nutrition; advanced biochemical methods applied to problems in nutrition.

523 Macro Mineral Metabolism 2 I 1971-72 a/y. Prereq A S 404 or 410; Chem 364. Dietary levels, absorption, excretion, and metabolism as affected by other nutrients, hormones, and species.

524 Micro Mineral Metabolism 2 II 1971-72 a/y. Prereq A S 404 or 410; Chem 364. Dietary levels, absorption, excretion, and metabolism as affected by other nutrients, hormones, and species.


562 Protein and Amino Acid Metabolism 2 I 1971-72 a/y. Prereq A S 404 or 410;


Animal Physiology and Breeding
A S

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

366 Reproduction and Artificial Insemination 3 (2-3) I Prereq V An 208 or Zool 251. Anatomy and physiology of reproductive organs; production and in vitro preservation of gametes; artificial insemination; prenatal development; fertility and infertility.

403 Physiology of the Domestic Animals 4 (3-3) I 1971-72 a/y. Prereq Bio S 103. The domestic animal as a living organism; structure in relation to function; responses to environment.

413 Physiology of Lactation 3 II 1971-72 a/y. Prereq V An 208. The endocrine system and the physiology of milk secretion, including bovine mammary anatomy, development, endocrine control, and synthesis of milk.

423 Animal Adaptation 2 I Prereq A S 200; Genet 301. Comparative mechanisms of the anatomical, physiological, biochemical, and behavioral processes in the adaptation of animals.

428 (528) Seminar in Animal Breeding 1 II Prereq A S 364. Current developments in genetics, physiology, and biometrical methods for applied livestock breeding.


Food Science
A S

102 Animal Products 3 (2-3) Animal products industries, including classification, grading, handling, use, and nutritional value.

170 Introduction to Food Industries 2 I Development and importance of different food industries.

208 Dairy Products Evaluation 1 (0-3) May be repeated for credit. II 1970-71 a/y. Scoring and market grading of dairy products and evaluation of defects.

215 Meats 3 (2-3) II Prereq A S 101. Farm butchering, meat cutting, and curing.

216 Institutional Meats 2 (1-3) II Selection, identification, and cutting for institutional purposes.

270 Food Selection and Appraisal 2 I Qualities of food necessary for acceptability by the consumer including government and industry standards.

295 Meat Grading and Evaluation 1 (0-3) May be repeated for credit. II Factors involved in selection, evaluation, and grading of carcasses and wholesale cuts of beef, pork, and lamb.

370 Food Chemistry 4 (3-3) I Prereq Chem 240. Fundamentals of food chemistry; composition of foods and the changes that occur during processing.

371 Food Analysis 4 (2-6) II Prereq A S 370. Instrumental analysis of food; methods common to many food commodities.


472 Dairy Products 4 (3-3) I Prereq Hort 470. Specialized techniques and practices of dairy product manufacturing and marketing. Field trip required.

473 Meat and Poultry Products 4 (3-3) II Prereq Hort 470. Specialized techniques and practices of meat, poultry, and egg processing and marketing. Field trip required.


511 Proteins of Food Products 2 II 1971-72 a/y. Prereq Chem 240; A S 386. Composition and physical properties; effects of processing and storage.

Problems, Seminar, and Research and Thesis
A S

425 Seminar 1 May be repeated for credit. Prereq senior standing.
Department of Animal Sciences

499 Special Problems 1-4 May be repeated for credit.
525 Seminar 1 May be repeated for credit. I
599 Special Problems 1-4 May be repeated for credit.
600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 20 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Animal Production

Students in this area emphasize livestock production (beef cattle, sheep, swine, horses), dairy production, or poultry production. The courses offered in this area are concerned with the production of farm animals; breeds, breeding, and physiology; feeding and nutrition; care and management; marketing; food products; wool and other animal byproducts.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 101 or Spe 112</td>
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</tr>
<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
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<tr>
<td>A S 101 or Elective</td>
<td>3</td>
</tr>
<tr>
<td>Ag 101 Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Math 101c*</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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Second Semester

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>Engl 101 or Spe 112</td>
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<tr>
<td>Chem 101 or 105</td>
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</tr>
<tr>
<td>Bio S 104 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>A S 102 Products</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
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Sophomore Year

First Semester

<table>
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<tr>
<td>Engl 201 Inter Comp</td>
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<td>Hum or Soc S Elective</td>
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</tr>
<tr>
<td>A S 200 Nutrition</td>
<td>4</td>
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<tr>
<td>Chem 102 or 106</td>
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<tr>
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Second Semester

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<th>Course</th>
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<tbody>
<tr>
<td>Chem 120 or 240</td>
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<tr>
<td>Bact 201 Microbiology</td>
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<td>Pl Sci or Ag Ec Elective</td>
<td>3</td>
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<tr>
<td>A S 206, 212, or Elective</td>
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<tr>
<td>Hum or Soc S Elective</td>
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Junior Year

First Semester

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<tr>
<td>Econ 102 and 201</td>
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<tr>
<td>Genet 301 Genetics</td>
<td>3</td>
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<tr>
<td>Biom 310 Ag Stat</td>
<td>3</td>
</tr>
<tr>
<td>A S 280 or Elective</td>
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<tr>
<td>Entom or Ag M Elective</td>
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Second Semester

<table>
<thead>
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<tbody>
<tr>
<td>A S 313 Feeding</td>
<td>3</td>
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<tr>
<td>Pl Sci or Entom Elective</td>
<td>3</td>
</tr>
<tr>
<td>V An 208 Anat and Physiol</td>
<td>4</td>
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<tr>
<td>A S 381, 382, or 383</td>
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<tr>
<td>Genet 364 Farm Animals</td>
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Senior Year

First Semester

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<tr>
<td>A S 410 or Elective</td>
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<tr>
<td>A S 366 Reproduction</td>
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<tr>
<td>Ag M or Ag Ec Elective</td>
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Second Semester

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<th>Course</th>
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<tr>
<td>A S 413 or Elective</td>
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<tr>
<td>A S 425 Seminar</td>
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</tr>
<tr>
<td>A S Elective</td>
<td>12</td>
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</tbody>
</table>

*Or a satisfactory mathematics score on the Washington Pre-College Test.

Students majoring in animal production must complete one of the following areas of emphasis:


Dairy Production: A S 208, 212, 270, 383, 413; V MS 261.

Poultry Production: A S 204, 205, 381, 403, 404, 473; V Mic 336.

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

Animal Nutrition

This major is designed for students interested in the nutrition of laboratory animals, poultry, swine, beef cattle, dairy cattle, sheep, and horses. Students taking this curriculum are urged to select courses in the physical and biological sciences in addition to those offered by the Department of Animal Sciences. If a student plans to enter graduate school, it is suggested that he elect two semesters of foreign language. Graduates in nutrition are in demand by medical laboratories, chemical companies, feed industries, foreign service, and federal and state governments.
## Freshman Year

### First Semester
- **Hours**
  - Engl 101 or Spe 112: 3
  - Math 107 Precalculus: 3
  - Chem 101 or 105: 4
  - A S 101 or Elective: 3
  - ROTC or Elective: 2
  - P E: 1/2

### Second Semester
- **Hours**
  - Engl 101 or Spe 112: 3
  - Chem 102 or 106: 4
  - Bio S 103 Introductory: 3
  - A S 102 Products: 2
  - ROTC or Elective: 1/2
  - P E: 

## Sophomore Year

### First Semester
- **Hours**
  - Chem 120 Quantitative: 2
  - Econ 102 or 201: 3
  - A S 200 Nutrition: 4
  - Bio S 104 Introductory: 4
  - ROTC or Elective: 2
  - P E: 1/2

### Second Semester
- **Hours**
  - Engl 201 or Com Elective: 3
  - Bact 201 Gen Microbiology: 4
  - A S 315 Feeding: 3
  - Chem 217 Quantitative: 4
  - ROTC or Elective: 2
  - P E: 1/2

## Junior Year

### First Semester
- **Hours**
  - Chem 240 or 241: 4
  - A S 404 Animal Nutr: 3
  - Genet 301 Genetics: 3
  - Agron Elective: 3
  - Elective: 3

### Second Semester
- **Hours**
  - Chem 242 Organic: 3
  - Gen Ag Elective: 3
  - A S 381, 383, or 385: 3
  - V An 208 Anat and Physiol: 4
  - Elective: 3

## Senior Year

### First Semester
- **Hours**
  - A S 382, 387, 388, or 465: 3
  - A S 410 Ruminant Nutr: 3
  - A S 403 Physiol: 4
  - Elective: 5

### Second Semester
- **Hours**
  - A S 425 Seminar: 1
  - A S 422 Growth: 2
  - Elective: 12

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

## Animal Biology

This major prepares students for advanced studies as scientists in the fields of animal physiology, genetics and nutrition, and veterinary medicine. Students may prepare for research careers with various industries or for teaching and research positions in colleges and universities.

### Freshman Year

### First Semester
- **Hours**
  - Engl 101 or Spe 112: 3
  - Math 107 or 202: 3
  - Chem 101 or 105: 4
  - A S 101 or Elective: 3
  - ROTC or Elective: 2
  - P E: 1/2

### Second Semester
- **Hours**
  - Engl 101 or Spe 112: 3
  - A S 102 Animal Products: 3
  - Chem 102 or 106: 4
  - Bio S 103 Introductory: 4
  - ROTC or Elective: 2
  - P E: 1/2

## Sophomore Year

### First Semester
- **Hours**
  - Econ 102 or 201: 3
  - Chem 120 Quantitative: 2
  - A S 200 Nutrition: 3
  - Bio S 104 Introductory: 4
  - ROTC or Elective: 2
  - P E: 1/2

### Second Semester
- **Hours**
  - Engl 201 or Com Elective: 3
  - Chem 240 or 241: 4
  - V An 208 or Zool 320: 4
  - Phys 101 General: 4
  - ROTC or Elective: 2
  - P E: 1/2

## Junior Year

### First Semester
- **Hours**
  - Phys 102 General: 4
  - Chem 242 Organic: 3
  - Genet 301 Genetics: 3
  - Biom 310 Ag Stat: 3
  - Bact 201 Gen Microbiology: 4

### Second Semester
- **Hours**
  - A S 313 Feeding: 3
  - A S 364 Farm Animals: 3
  - A S Elective*: 3
  - Gen Ag Elective: 3
  - For L Elective: 4
Senior Year

First Semester
- A S 404 or 410 4
- A S 366 Artificial Insem 3
- A S 403 or Zool 353 4
- A S 423 or Biom 310 3
- Elective 3

Second Semester
- A S 425 Seminar 1
- A S 413 Physiol of Lactation 3
- Elective 8
- For L Elective 4

* A S 381, 382, 383, 385, 387, 388, or 465.

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

Second Semester
- Bact 201 Gen Microbiol 4
- Engl 201 Inter Comp 3
- Phys 102 General 4
- Econ 201 Principles 4
- ROTC or Elective 2
- P E 1/2

Summer Session

Summer Experience ("Practicum")

Junior Year

First Semester
- Bact 416 Micro of Food 3
- Chem 221 or 217 4
- A S 370 Fd Chem 4
- Ag E: 350 Ag Bus Mgt 3
- A S 200 Prin Nutrition 3

Second Semester
- A S 371 Fd Analysis 4
- F S 403 Ag Process 3
- Hort 470 Prin Fd Pres 3
- A S or Hort Elective 3
- Hum or Soc S Elective 3

Summer Session

Summer Experience ("Practicum")

Senior Year

First Semester
- Hort 471 Fruit and Veg Proc 4
- A S 472 Dairy Products 4
- Elective 7

Second Semester
- A S 473 Meat and Poul Prod 4
- F S 474 Cereal Products 3
- Elective 8

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

Food Science

( Offered jointly by Animal Sciences and Horticulture)

This major prepares students for positions in the food processing or allied industries. The graduate may also choose a career in teaching, research, or government control laboratories. Emphasis is placed on the application of a knowledge of the basic sciences to the processing and distribution of foods, including quality control and the development of new products for the consumer. Departmental electives provide for a choice of emphasis in dairy, red meats, or poultry products.

Freshman Year

First Semester
- Engl 101 Composition 3
- A S 170 Fd Industry 2
- Chem 105 Principles 4
- Math 107 Precalculus 3
- ROTC or Elective 2
- P E 1/2

Second Semester
- Chem 106 Principles 4
- Spec 112 Fundamentals 3
- Hum or Soc S Elective 3
- A S 102 or Hort 101 3
- ROTC or Elective 2
- P E 1/2

Sophomore Year

First Semester
- Bio S 103 Intro Biol 4
- A S 270 Fd Select and Appraisal 2
- Phys 101 General 4
- Chem 240 Elem Org Chem 4
- ROTC or Elective 2
- P E 1/2

Preparation for Graduate Study

Programs of study leading to advanced degrees include several fields of specialization. Students with undergraduate majors in other applied animal sciences, zoology, biochemistry, physiology, and bacteriology, as well as those with majors in animal sciences, may be well prepared for graduate study in this department. Adequate opportunities are provided for removing deficiencies by taking appropriate courses or special examinations.

Students who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work should elect courses similar to those listed in the various areas of their special interest.
Department of Anthropology

Professor and Acting Chairman of the Department, W. E. Sibley; Professors, R. D. Daugherty, A. H. Smith; Associate Professors, R. E. Ackerman, R. A. Littlewood, A. C. Satterwhite; Assistant Professors, H. R. Bernard, W. M. Bryant, Jr., Johnetta B. Cole, R. Fryxell, J. A. Goss, H. T. Irwin, G. S. Kriantz.

The courses in anthropology are designed to familiarize the student with the evolution of man, the prehistoric development of culture, and the patterns of cultural behavior in contemporary primitive and folk societies.

The major in anthropology receives broad training in such fields as archeology, primitive institutions, physical development of man, linguistic anthropology, and culture and personality. Several types of positions are open to him such as those in teaching, research, museum work, and foreign service. It is strongly recommended that an anthropology major do graduate work in order to improve his vocational opportunities.

The extensive anthropological collections in the library, which include such research tools as the Human Relations Area Files microcard collection and the Peabody Museum Catalog of anthropological publications, form a comprehensive body of material useful in research. The collections of the Laboratory of Anthropology are also available for study.

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

Description of Courses

Anth For explanation see Index under "Symbols"

101 [S] Introduction to Cultural Anthropology 3 Origin and development of prehistoric cultures; economic; social, and religious systems of contemporary preliterate societies; culture and language; culture change.

102 Introduction to Physical Anthropology 3 Evidences for human evolution; processes of racial diversification; techniques of physical anthropology.


198 [S] Anthropology Honors 3

201 [H] Arts of Preliterate People 3 Forms and cultural roles of art, music, and folklore in primitive societies.

252 Indians of North America 3 Prereq Anth 101 or Soc 101. Culture areas of North America; analysis and comparison of representative cultures.

254 Anthropology and World Problems 2 Prereq Anth 101 or Soc 101. Data and techniques of physical and cultural anthropology applied to the solution of social and political problems.

261 Archeology 3 Prereq Anth 101, 6 hrs Soc 5, or 4 hrs Geol. Techniques of excavation and laboratory study; analysis and interpretation of archeological materials.

316 Archeology of North America 3 Prereq Anth 101. Prehistoric cultures north of Mexico; area adaptations; influence from adjoining areas.

325 Anthropology of Africa 3 Prereq Anth 101 or Soc 101. The races, languages, prehistory, and cultures of sub-Saharan Africa.

326 Afro-American Peoples 3 Analysis of selected Afro-American subcultures.

351 Peoples and Cultures of Latin America 3 1 1971-72 a/y. Prereq Anth 101. Modern and aboriginal cultures of Latin America and the Caribbean; comparative, structural, and historical problems.


358 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.

363 Field Methods 8 Prereq admission by arrangement. Practice in methods of archeological, ethnological, or linguistic field research.

366 Religion of Primitive Peoples 3 Prereq Anth 101 or Soc 101. Preliterate religious concepts, practices, and practitioners; the religious complex of selected primitive cultures.

420 Research Design and Analysis 3 (2-3) II 1971-72 a/y. Prereq 9 hrs Anth. Anthropological field research design; field and laboratory techniques; methods of data analysis.

432 Old World Prehistory 3 II 1971-72 a/y. Prereq Anth 103, 261, or 316. Advanced prehistory of Europe, Asia, and Africa; cultural sequences and technology.
450 General Linguistics 3 Prereq Anth 101 or 8 hrs For L. Anthropological uses of linguistic data; language structure.

451 Language and Culture 2 II 1971-72 a/y. Prereq 6 hrs Anth or 8 hrs For L. Relations of language to other aspects of culture; role in cultural processes and patterning.

452 Historical and Comparative Linguistics 3 I 1971-72 a/y. Prereq 8 hrs Fren or Ger; Anth 450.


460 Anthropology of the Far East 3 Prereq Anth 101, Soc 101, or 6 hrs Soc S. The races, languages, and folk cultures of China, Korea, and Japan.

462 Primitive Culture Types 3 Prereq 6 hrs Anth. World ethnographic survey of bands, tribes, chiefdoms, and primitive states; technology; social and ideological institutions.

465 Evolution of Man 3 Prereq Anth 102; Bio S 101. Human origins in the light of the fossil record and evolutionary theory.

466 Human Osteology 3 (2-3) I Prereq Anth 102, 465. Observations and measurements of human skeleton; variations based on age, sex, and race; comparisons with fossil man and higher primates.

470 Ethnology of the Circumpolar Regions 3 Prereq Anth 101 or Soc 101. Representative cultures within the circumpolar regions.

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

501 Methods and Theories in Physical Anthropology 3 May be repeated for 6 hours credit. Prereq Anth 102, 453, 465. Investigation of selected areas of research in modern physical anthropology.

502 Methods and Theories in Archeology 3 May be repeated for 6 hours credit. Prereq Anth 261 or 316. History, development, and current trends in research methods and theories in archeology.

503 Methods and Theories in Linguistic Anthropology 3 May be repeated for 6 hours credit. Prereq Anth 450. Principal theoretical approaches to analysis of language structure, analytical techniques, and linguistic concepts in anthropology.

504 Methods and Theories in Cultural and Social Anthropology 3 May be repeated for 6 hours credit. Prereq 6 hrs Soc S. Evaluation of major theories and methods and their relationship to "problems" in cultural-social analysis.

505 Culture Dynamics 3 Culture change through the processes of innovation, diffusion, and acculturation.

506 Comparative Agrarian Societies 3 The interrelationships of city, peasantry, and state; theoretical contributions and representative studies.

509 Cultural Ecology 3 Ecological principles applied to problems involving human populations.

510 Seminar in Social Organization 3

530 Ethnology of Selected Areas 3 May be repeated for credit.

531 Ethnology of Western North America 3 Native North American culture types west of the Rockies; selected social systems, economies, technologies, and environmental factors.

534 Ethnology of South and Southeast Asia 3 The peoples, languages, and cultures of South and Southeast Asia; their history, development, and spread.

535 Ethnology of Oceania 3 Culture areas of the Pacific; the major cultural types of Polynesia, Micronesia, Melanesia, and New Guinea.

540 Prehistory of Selected Areas 3 May be repeated for credit.

541 Prehistory of Western North America 3 The four major prehistoric cultural areas of western North America; cultural development, change, and interrelationships.

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

543 Lithic Technology 2 (1-3) II Manufacturing of stone implements; theory of rock fracture; nonhuman production of pseudo-artifacts.

545 Historical Archeology 3 II Excavations and analysis of historical archeological sites; acculturational implications. Field
trips required. Cooperative course taught at the University of Idaho.

546 Interpretation of Paleoenvironments 3 (2-3) Prereq Anth 261; Geol 302 or 430; Soils 404. Pleistocene paleoclimatic changes as inferred from sediments, landforms, and fossil soils of archeological importance.

547 Physical Stratigraphy of Archeological Sites 3 (2-3) Prereq Anth 546. Recognition, description, sampling, and analysis of sediments typically found with human cultural materials.

548 Paleoeology 3 I Interpretations of past environments, stressing the interrelations of physical and biological factors. Cooperative course taught at the University of Idaho.

552 Identification of Faunal Remains 4 (3-3) I Prereq Zool 320, 428. The relevance of faunal remains in archeological context; excavating, preserving, and identifying bones commonly encountered in archeological sites.

553 Introduction to Quaternary Vertebrates 4 (3-3) II Prereq Anth 552. Ecological and paleoecological techniques as tools for enhancing interpretation of problems in prehistory; importance of faunal changes through time.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 37 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 30 hours in anthropology.

The anthropology major will take two courses from each of the following series:

- (1) Anth 101, 198, 252, 325, 326, 351, 353, 460, 470;
- (2) 102, 455, 465, 466;
- (3) 103, 261, 316, 432;
- (4) 450, 451, 452, 453;
- (5) 358, 366, 457, 462. 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


Architecture is an art and a science dedicated to the creation of appropriate and meaningful environments which will support and benefit the activities of man. The architect today works at many different levels depending upon his circumstances, interests, and abilities. He may be a practitioner, teacher, or researcher. He may work for himself, in a partnership, for a corporation, or for government. He may work on items as small as a piece of hardware or in similar areas of narrow concern. He may have the responsibility of guiding the design of an entire new city or a region. In any case, the architect is required to have a high level of intuitive and creative ability combined with an appreciation for the analytical and scientific processes which are consistent with the technology of his time. To create an environment for people, an architect must understand the needs of people and the processes, materials, and techniques which are available or required to fulfill these needs.

As designers do not work alone, there is much opportunity for people who have a great variety of skills to be involved in the building process. Today the building industry faces the challenge of assuming a responsible part towards the creation of a better environment for the future. To participate in the building industry is a thought-provoking, stimulating, and rewarding experience.

There is a broad range of needs within the field of architecture. There is a wide range of differences in interests, abilities, and levels of experience in students. The student is encouraged to develop in-depth strengths in one of the following specialized fields:

- materials, foundations, structures, building systems, acoustics, management systems, real estate, English, economics, political science, humanities, social science, biological science, geography, anthropology, philosophy, psychology, painting, sculpture, ceramics, computer science, and history.

A student planning to attend Washington State University and to enroll in architecture must be prepared to assume responsibility for his own education.

75
The five-year course of study at Washington State University gives the student an opportunity to create a foundation from which to develop his particular interests, strengths, areas of concern, and contribution. The four-year course of study in Building Theory and Practice is available for those who wish to pursue the area more closely related to management.

The Department of Architecture is a member of the Association of Collegiate Schools of Architecture. The department is not accredited by the National Architectural Accrediting Board.

The department offers courses of study leading to the degrees of Bachelor of Architecture and Bachelor of Science in Building Theory and Practice.

Description of Courses

Arch For explanation see Index under "Symbols"

110 Architecture Orientation 1 (0-3) I For freshmen only. Various fields of architecture; employment possibilities, professional ideals, and ethics; methods and procedures concerning problems encountered.

115 [H] Architectural History 3 I For non-majors. Historical account; analysis; structural aspects, materials, decoration of Egyptian, Western Asiatic, Greek, Roman, Early Christian, Byzantine, and Romanesque architecture.

116 [H] Architectural History 3 II For non-majors. Gothic, Renaissance, and Baroque architecture in Europe; total development in USA; pre-Columbian and Baroque in South America; modern architecture.

161 Graphics 2 (0-6) I Drawing and lectures; line drawing techniques; descriptive geometry and orthographic projection; emphasis on architectural problems through drawing and model building.

162 Graphics 3 (0-9) II Drawing and lectures. Principles and methods of linear perspective; shades and shadows in architectural practice.

220 Building Materials 3 Materials and their uses; types of construction used for various parts of buildings.

255 Architectural Drawing 3 (1-6) I Prereq M.E 101 or drafting experience. Lettering and drafting techniques; construction and design principles of simple frame residences; working drawings for residential construction.

263 Graphics 3 (1-6) I Prereq Arch 162. Advanced graphics; advanced descriptive geometry; model building techniques; perspective and other graphic techniques used in visual communications.

271 Basic Design 3 (0-9) I Form and composition; design fundamentals applied to two- and three-dimensional exercises emphasizing integration with architectural problems.

272 Architectural Design 3 (0-9) II Prereq Arch 271. Basic design approach continued with emphasis on unifying esthetics and function; small architectural problems studied, designed, and presented.

315 (215) Architectural History 3 I For majors. Same as Arch 115.

316 (216) Architectural History 3 II For majors. Same as Arch 116.

320 Structure in Architecture 3 II Prereq junior standing. Historical development of structural forms, structural materials; analysis and synthesis of structural systems, construction methods, grids, plates, membranes, and thin shells.


322 (222) Building Construction 3 II Prereq Arch 321. Continuation of Arch 321.

346 Building Sanitation 2 II Prereq Phys 102 or 202. Materials, fittings, plumbing fixtures, and methods of assembly; arrangement and design of typical supply and sanitary layouts.

358 Residence Architecture 3 Prereq junior standing. House planning: function, circulation, flexibility, zoning, orientation, site planning, interior design, materials, equipment, construction, and small residence design problems.

359 Hotel Planning 3 II 1970-71 a/y. Prereq junior standing. Design of the various departments, materials, construction, and other features of the modern hotel.

373 Architectural Design 4 (0-12) I Prereq Arch 272. Design of buildings of simple requirements and limited size, relation of plan requirements to plan.
form; construction and composition of exteriors.

Architectural Design 4 (0-12) II Pre-req Arch 373. Continuation of Arch 373. Site plan, form, and composition; integration of construction methods; materials, plan, and elevations; development of presentation techniques.

Architectural History 3 I Pre-req Arch 316. The history of architecture of the 19th century; the European and American development.

Architectural History 3 II Pre-req Arch 417. The history of architecture of the 20th century; the European and American development.

Contract Drawings 3 (1-6) I Pre-req Arch 220. Architectural detailing and contract graphical representation; methods, techniques, and rationale.

Contract Drawings 3 (1-6) II Pre-req Arch 427. Continuation of Arch 427.

Architectural Acoustics and Lighting 3 II Pre-req senior standing. Fundamentals of architectural acoustics; noise control; lighting for architecture; the lighting program and system.

Building Estimating 3 II Pre-req Arch 427; Econ 102. Factors affecting construction costs; suitability of estimating systems; quantity surveys, error sources; detailed estimates of actual buildings.

Architectural Design 5 (0-15) I Pre-req Arch 374. Architectural and site planning problems of increased complexity and size; relation to surrounding areas; research and preliminary presentation.

Architectural Design 5 (0-15) II Pre-req Arch 475. Continuation of Arch 475. Larger and more complex buildings; student participation in problem preparation; scheduling of problem development.

Architectural Design 7 (0-21) I Pre-req Arch 476. Continuation of Arch 476.

Architectural Design 7 (0-21) II Pre-req Arch 477. Continuation of Arch 477. Research and solution of an important building; presentation drawings and a scale model required.

City and Regional Planning 3 (2-3) I Pre-req Arch 272; course in Soc. History and principles of city planning; contemporary urban problems and solutions; types and aspects of regional planning; architectural site planning.

Special Problems 1-4 May be repeated for credit.

Schedule of Studies

Architecture—Five-Year Curriculum

The Department of Architecture is in a state of transformation.

The schedule of studies as listed below is based on two years of general education and three years of professional work leading to a Bachelor of Architecture degree.

The next stage of the transformation will be two years of general education, two years of pre-professional education, and one year of professional work leading to a Bachelor of Architecture degree.

The purpose of this time structure is to accommodate the students who attend a community college; to accommodate the students from other fields of study; to allow the students more points of access to, and of egress from, the department—with the express intent to accommodate the individual’s social and economic needs and to recognize that there are differences in the learning patterns, interests, and experience of the individual student.

It will be the student's responsibility to develop his academic program for the first two years. This program should be an expression of the student’s interests. At the same time it should be structured to develop an understanding and an awareness of man’s total environment. The student should consider including contact with the earth, physical, life, and social sciences. He should have strong contact with the humanities.

A minimum of 60 hours credit will be required for admission into the junior year of the Department of Architecture. This shall include those courses that have been listed for the freshman and sophomore years.

At least 48 of the total hours required for the bachelor's degree in the program must be in upper-division courses.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 110 Orientation</td>
<td>1</td>
</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Drawing Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>3</td>
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<tr>
<td>P E</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 171 Anal Geom and Calc</td>
<td>4</td>
</tr>
<tr>
<td>Engl 108 or Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td>Drawing Elective</td>
<td>2-3</td>
</tr>
<tr>
<td>Bio S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>3</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Sophomore Year

First Semester
- Phys 103 or 201: 4 hours
- Hum or Soc S Elective: 3 hours
- Drawing Elective: 2-3 hours
- ROTC or Elective: 2-6 hours
- P E: 1/2 hour

Second Semester
- Phys 104 or 202: 4 hours
- Hum or Soc S Elective: 3 hours
- Drawing Elective: 2-3 hours
- ROTC or Elective: 2-6 hours
- P E: 1/2 hour

Junior Year

First Semester
- Arch 271 Design: 3 hours
- Arch 373 Design: 4 hours
- Arch 315 History: 3 hours
- Arch 320 or E E 401: 3 hours
- C E 310 Mechanics: 4 hours

Second Semester
- Arch 272 Design: 3 hours
- Arch 374 Design: 4 hours
- Arch 316 History: 3 hours
- Arch 220 Materials: 3 hours
- C E 330 Mech of Structures: 5 hours

Senior Year

First Semester
- Arch 427 Contract Drawings: 3 hours
- Arch 475 Design: 5 hours
- Arch 417 History: 3 hours
- Arch 447 or M E 319: 3 hours
- C E 471 Structural Design: 4 hours

Second Semester
- Arch 428 Contract Drawings: 3 hours
- Arch 476 Design: 5 hours
- Arch 418 History: 3 hours
- Arch 346 Sanitation: 2 hours
- C E 472 Structural Design: 4 hours

Fifth Year

First Semester
- Arch 477 Design: 7 hours
- Arch 485 Urban Planning: 3 hours
- Elective: 6 hours

Second Semester
- Arch 478 Design: 7 hours
- Arch 453 Estimating: 3 hours
- Elective: 6 hours

Transfer Students

It is recommended that students planning to transfer into the curriculum complete the freshman and sophomore schedule and transfer to Washington State as juniors.

It is also recommended that students in community colleges keep in contact with the Department of Architecture every semester regarding changes that have been made since the date of this publication.

Schedule of Studies

Building Theory and Practice

This curriculum has been developed to guide the student to a broader knowledge and understanding of the various technical and other phases of the building industry. Graduates may enter the residential and other light construction fields, building materials sales and development, or other allied building and construction work such as insurance adjustment, building inspection, supervision, and contracting.

At least 26 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester
- Math 107 Precalculus: 3 hours
- Engl 101 Composition: 3 hours
- Arch 161 Graphics: 2 hours
- Elective: 3 hours
- Arch 220 Building Materials: 3 hours
- ROTC or Elective: 2 hours
- P E: 1/2 hour

Second Semester
- Soc 101 Introduction: 3 hours
- Arch 255 Arch Drawing: 3 hours
- C E 101 Intro to Survey: 3 hours
- Geol 101 Introductory: 4 hours
- ROTC or Elective: 2 hours
- P E: 1/2 hour

Sophomore Year

First Semester
- Econ 102 Fundamentals: 3 hours
- Phys 101 General: 4 hours
- B A 210 Bus Law: 3 hours
- Cpt S 201 Computer Prog: 2 hours
- Elective: 2 hours
- ROTC or Elective: 2 hours
- P E: 1/2 hour

Second Semester
- Econ 203 Fundamentals: 3 hours
- Phys 102 General: 4 hours
- Math 201 Finite: 3 hours
- Bio S Elective: 3 hours
- ROTC or Elective: 2 hours
- P E: 1/2 hour
Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Arch 321 Build Const</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arch 358 Residence Arch</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>M E 319 Heat and Vent</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 230 Prin of Acctg</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>B A 315 Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Second</td>
<td>Arch 322 Bldg Const</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arch 346 Bldg Sanitation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 305 Real Estate</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 231 Prin of Acctg</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 340 Production</td>
<td>3</td>
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</tbody>
</table>

Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Arch 427 Contract Drawings</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 320 Insurance</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Econ 350 Labor Econ</td>
<td>3</td>
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<td></td>
<td>Approved Elective</td>
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<tr>
<td></td>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Second</td>
<td>Arch 428 Contract Drawings</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arch 485 City Planning</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Arch 453 Building Est</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B A 350 Personnel</td>
<td>3</td>
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<tr>
<td></td>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Suggested Electives: B A 201, 310, 325, 360; Econ 301, 320, 450; Arch 115, 116, 320, 447; Cpt S 301, 420.

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

Transfer Students

It is recommended that students planning to transfer into this curriculum complete the above freshman schedule and transfer to Washington State as sophomores.

Program in Asian Studies

Instructor and Coordinator, Shane Ryland.

The Program in Asian Studies is designed to provide students with a broad exposure to an area of the world which is rich in cultural heritage and of vital concern to the United States. The cross-disciplinary nature of the program is especially suited to the study of the many levels of living and heterogeneous social patterns which characterize Asian societies.

The program leads to the degree of Bachelor of Science in Asian Studies.

Schedule of Studies

At least 39 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Students should satisfy three-fourths of the General University Requirements in the College of Sciences and Arts in the freshman and sophomore years and complete these requirements by the end of the junior year. Students must complete at least 39 hours of courses on Asia and related subjects selected in consultation with the Program Coordinator. Of these 39 hours, at least 21 must be at the 300-level and above. The courses listed below are recommended for meeting the program's requirements.

Freshman and Sophomore Years

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Anth 101 Cultural</td>
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<td>Econ 201 Principles</td>
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<td>Geog 102 Hum Geog</td>
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<tr>
<td>Hist 250 Intro South Asia</td>
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<td>Hist 251 Intro East Asia</td>
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<tr>
<td>Phil 101 Introduction</td>
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<tr>
<td>Phil 107 Phil of Religion</td>
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<td>Phil 207 Phil of India</td>
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<td>Pol S 102 Comparative Politics</td>
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Junior and Senior Years

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<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Anth 460 Far East</td>
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<tr>
<td>Anth 534 South &amp; SE Asia</td>
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<tr>
<td>Anth 535 Oceania</td>
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<tr>
<td>Econ 472 Development</td>
</tr>
<tr>
<td>Geog 333 Asia</td>
</tr>
<tr>
<td>Hist 420 India, 1757-1947</td>
</tr>
<tr>
<td>Hist 421 Revolutionary China</td>
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<tr>
<td>Hist 423 20th Cent East Asia</td>
</tr>
<tr>
<td>Hist 424 Ind &amp; Pak Since 1947</td>
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<tr>
<td>Phil 315 China and Japan</td>
</tr>
<tr>
<td>Pol S 335 Asian Govt</td>
</tr>
<tr>
<td>Pol S 515 China and Japan</td>
</tr>
<tr>
<td>Pol S 516 SE Asia</td>
</tr>
<tr>
<td>Special Problems 499</td>
</tr>
</tbody>
</table>

Courses printed in Roman type are required for graduation, in italics are optional.
Department of Bacteriology and Public Health

Associate Professor and Chairman of the Department, H. M. Nakata; Professors, C. H. Drake, Elizabeth R. Hall, J. L. Stokes; Associate Professors, R. E. Hurlbert, O. H. Johnson; Assistant Professors, D. J. Hinrichs, L. P. Mullaney, K. L. McIvor, K. D. Spence. Adjunct Associate Professor, W. R. Wiley, Pacific Northwest Laboratories, Richland, Wn.

Bacteriology, often and properly called microbiology, is both a basic and an applied science. In addition to general bacteriology the Department of Bacteriology and Public Health offers courses of study in several specialized fields of basic and applied microbiology. The objectives of the department are to confer undergraduate and advanced degrees in bacteriology and public health; to train students in the applied fields of bacteriology, public health, and medical technology; and to provide service courses that help fulfill basic science requirements for graduation. Students majoring in the department may also complete premed requirements in a four-year course. Students who complete Bact 418 as a part of their training are eligible for registration as medical technologists.

The department offers courses of study leading to the degrees of Bachelor of Science in Bacteriology and Public Health, Master of Science in Bacteriology and Public Health, and Doctor of Philosophy (Bacteriology).

Description of Courses

For explanation see Index under "Symbols"

Bacteriology

Bact

101 [B] Elementary Bacteriology and Public Health 4 (3-3) Students who receive a B grade in this course may substitute it for Bact 201 as a prereq for advanced courses. Biology of bacteria with special reference to man. Credit not granted for both Bact 101 and 201.

201 [B] General Microbiology 4 (3-3) Prereq 1 yr college chem; 1 sem college biol. The classification, physiology, and techniques for cultivation of microorganisms, especially bacteria; applications to agriculture, medicine, and industry.

265 Sanitary Bacteriology 3 (1-6) II Prereq Bact 201; Chem 217. Theory and techniques.

310 Medical Bacteriology 5 (3-6) I Prereq Bact 201. The bacterial pathogens and their relationship to disease.

350 Clinical Laboratory Procedures 4 (2-6) II Prereq Bact 201; Org and Quant Chem. Techniques, interpretations, and theory.

412 Immunology 4 (2-6) I Prereq Bact 310; Org Chem. Principles.


416 Microbiology of Foods 3 (2-3) I Prereq Bact 201; Org and Quant Chem. Microorganisms important in foods; reference to spoilage processes and their control.

418 Advanced Clinical Diagnosis 16 (5-33) Prereq completion of departmental and General University Requirements for graduation. Clinical training for one year in hospitals approved by the American Society of Clinical Pathologists.

451 Higher Bacteria and Fungi 3 (2-3) II Prereq Bact 310. Occurrence and activities of the higher bacteria and fungi as free living and parasitic organisms.

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

514 Selected Topics in Microbiology 2 May be repeated for credit. II Prereq 9 hrs upper-division Bact.

528 Microbial Physiology 4 (2-6) II Prereq Bact 201; Chem 217, 364, 366. Cytology, growth, nutrition, and metabolism of microorganisms.

541 Seminar 1 May be repeated for credit. Literature reviews and research reports.

570 Advanced Immunology and Immunoc hemistry 4 (2-6) II Prereq Bact 412; Chem 366. Biology of the immune process; chemistry and function of immunoglobulins.

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

600 Research, Thesis, or Examination Variable credit.

Public Health

Pub H

299 Public Health Problems 1-3 May be repeated for credit.

352 Environmental Health Practices 3 (2-3) II 1970-71 a/y. Prereq Bact 201. Organization and development of environmental health services in official health agencies and industrial organizations.
Sanitary Science 3 (2-3) II 1971-72 a.y. Prereq Bact 201. Maintaining environmental health standards in rural and small urban areas.


Field Training for Sanitarians 8 (lectures, laboratory, and field work 40 hrs per week for 12 weeks) Prereq Bact 310; Chem 217, 240; Pub H 352 or 355, 401 or 404; 6 hrs Zool. Participation in an organized public health program conducted at the State Department of Health.

Special Problems 1-4 May be repeated for credit.

The following courses are available to students, with the approval of the department chairman, as part of their major work in this department: V Mic 433, 531, 532; Zool 417.

Schedule of Studies

At least 20 of the total hours required for the bachelor's degree in this program must be in upper-division courses. The basic requirements for the freshman and sophomore years are the same for bacteriology, medical technology, and public health options.

Freshman Year

First Semester

Engl 101 Composition
Chem 101 or 105
Bio S 103 Intro Biol
Elective
ROT C or Elective
P E

Second Semester

Chem 106 or 102 and 120
Math 107 or 201
Bio S 104 Intro Biol
Elective
ROT C or Elective
P E

Second Semester

Chem 217 Quant Analysis
Phys 101 General
Bact 201 Gen Microbiol
ROT C or Elective
P E

Second Semester

Chem 240 or 241 or 242 and 243
Phys 102 General
Elective
ROT C or Elective
P E

Bacteriology and Medical Technology Options

Junior Year

First Semester

Bact 310 Medical Bact
Bact 416 Micro of Foods
Chem 364 Int Biochem
Chem 366 Biochem Lab
Elective

Second Semester

Bact 350 Clinical Lab Proc
Bact 265 Sanitary Bact
Bact 451 Bact and Fungi
Elective

Senior Year

First Semester

Bact 412 Immunology
Elective

Second Semester

Bact 414 Gen Virology
Zool 417 Parasitology
Elective

Bacteriology Option: student must take three of the following: Bact 265, 350, 416, 451.

Medical Technology Option: Bact 350 is required. In addition, student must take two of the following: Bact 265, 416, 451.

Recommended additional courses: Genet 301; Zool 251; Math 171, 172.

Public Health Option

Junior Year

First Semester

Pub H 401 or 404
Bact 310 Medical Bact
Bact 416 Micro of Foods
Elective

Second Semester

Pub H 352 or 355
Bact 265 Sanitary Bact
Chem 364 Int Biochem
Chem 366 Biochem Lab
Elective

Senior Year

First Semester

Pub H 404 or 401
Entom 448 Med Entom
Elective

Second Semester

Pub H 355 or 352
Bact 414 Gen Virology
Elective

81
Recommended additional courses: Bact 412, ub H 490; A S 310, 426; Math 171, 172; ool 417.

Courses printed in Roman type are required or graduation, in italics are optional.

Transfer Students

Students transferring from other institutions; juniors should have taken the equivalent of Bact 201; Chem 105, 106, and 217 or 240 (preferably both); Engl 101; Bio S 103, 104; one year of 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 fitted into the upper-division program.

Preparation for Graduate Study

or admission to graduate study in bacteriology student should have a bachelor's or master's degree and should present evidence of proficiency in academic work. Normally the applicant should have an undergraduate major in bacteriology, biological science, or chemistry; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in bacteriology.

As preparation for work toward an advanced degree a student should have completed Bact 01, 310; Chem 105, 106, 217, 240 or preferably Chem 241, 242, and 243; Bio S 103, 04; Phys 101 and 102. Mathematics through calculus and a reading knowledge of French, German, or Russian are strongly recommended.

Program in General Biology

Associate Professor and Acting Chairman of the Program, R. J. Jonas; Professors, A. L. Owen, C. W. McNeil, V. Schultz; Associate Professors, H. A. West; Assistant Professors, J. Broth, J. C. Hickman, L. P. Mallavia, R. Rayburn, K. D. Spence, G. G. Sponer; Instructors, R. D. Murray, W. A. Van Camp.

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 Master of Arts in the Teaching of Biological Science.

Description of Courses

Bio S For explanation see Index under "Symbols"

101 [B] An Integrated Course in the Biological Sciences 3 Not open to students who have taken another course in the biological sciences, including Bact 101, except with written permission of the Program Chairman. Attributes of living things, unifying concepts, and methods of the biological sciences.

102 [B] General Biology 4 (3-3) Not open to students who have taken another course in the biological sciences, including Bact 101, except with written permission of the Program Chairman. Nature of living things, methods, principles, elements of structure, and function of diverse organisms.

103 [B] Introductory Biology 4 (3-3) Pre-req 1 sem Chem or c/. Not open to students who have taken Bio S 101 or 102. First semester of a one-year sequence. Recommended for pre-professional and interested general students. Nature of living things, their organization, structure, functions, and evolution.

104 [B] Introductory Biology 4 (3-3) Pre-req Bio S 101, 102 or 103; 2 sem Chem or c/. Continuation of Bio S 103.

298 [B] Biological Science Honors 4 (3-3) II Prereq Ph S 298.

330 Principles of Teaching Biological Science 2 (1-3) Prereq 9 hrs Bio S. Methods, philosophy, and structure of biological science with reference to their application in teaching secondary biology.


405 Electron Microscope I I Theory and use; specimen preparation and interpretation; especially in biology; demonstrations.


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


599 Special Problems 1-4 May be repeated for credit.
Program in Biophysics

Professor and Acting Chairman of the Program, O. Biddulph; Assistant Professors, H. Grubauer, J. A. Magnuson, J. E. Scheibe, H. E. Andberg; Instructor, M. C. Drew.

Biophysics is an interdisciplinary science and involves the application of methods, theories, and instrumental techniques of physics and chemistry to biological systems. The curriculum of the biophysics program is designed to complement those courses in physics, chemistry, mathematics, and biology that normally converge in this common area. Staff members in the program have special competence and research interests in structure and function of biomolecules, ion binding to biomolecules, ion sorption, membrane phenomenon, transport, and photobiology. The research facilities include a wide line and high resolution nuclear magnetic resonance spectrometer, an electron aramagnetic resonance spectrometer, a high intensity grating spectrograph, a photochrome assay spectrometer, and an atomic absorption spectrometer. Complete facilities for studies of ion uptake and for transport phenomena are available.

Undergraduate students interested in biophysics should obtain a general background in biology, physics, chemistry, and mathematics during the freshman and sophomore years. During the junior and senior years the student will specialize in biophysics and one or more of the related sciences, where the bachelor's degree is granted, i.e., biology, chemistry, mathematics, or physics.

Biophysics will serve as a minor area of specialization for Master's and Ph.D. programs in biology, chemistry, mathematics, and physics. Students trained in this area can normally participate in college teaching, space research, industry, governmental research, bioengineering, and systems analysis in environmental and physiological studies.

Description of Courses

Bio P For explanation see Index under "Symbols"

12 Introduction to Molecular Biophysics 3 II Prereq Math 172; Chem 106; Phys 102; Bio S 103. Application of physics and chemistry to the study of biological molecules and their interactions.

17 Introduction to Environmental Biophysics 2 II 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.

418 Environmental Biophysics Laboratory 1 (0-3) II Prereq Bio P 417 or c/c. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments.

430 Ultraviolet and Visible Spectroscopy 2 I Prereq Chem 332. Optimum conditions for spectral measurements; quantum description of electronic transitions in conjugated molecules and metallocomplexes; optical spectroscopy applied to biomolecular problems.

432 Magnetic Resonance Spectroscopy 2 II Prereq Chem 332. Nuclear magnetic resonance and electron paramagnetic resonance spectroscopy as used in studying biological systems; basic theory and applications.

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

534 Mathematical Modeling of Biological Systems 3 II 1970-71 a/y. Same as Zool 554.

564 The Physical Chemistry of Biological Macromolecules 3 II 1970-71 a/y. Same as Chem 564.

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

Department of Botany

Professor and Chairman of the Department, A. Hecht; Professors, O. Biddulph, R. Dauenhimer, N. Higginbotham, M. Owney; Associate Professors, H. E. Brewer, A. L. Cohen, A. A. Gridland; Assistant Professors, J. C. Hickman, W. R. Rayburn, J. E. Scheibe, L. K. Shumway, G. G. Spomer.

Botany is the basic plant science. The courses offered in the department are designed to meet the needs of three groups of students: (1) those planning to specialize in an applied science such as agronomy, bacteriology, forestry, horticulture, pharmacy, plant pathology, range management, and wildlife biology; (2) those wishing to study a biological science for its cultural or educational value; and (3) those who plan to specialize in botany. Those in the first group will desire to obtain as comprehensive a knowledge of the field as time will permit. The second group may find one
year of introductory work sufficient. For the third group the department offers courses leading to advanced degrees in botany.

The department has laboratories and equipment suitable for graduate study in the major areas of botany, and special facilities for work in the fields of autecology, biochemistry, biophysics, chemotaxyonomy, cytogenetics, cytotaxyonomy, developmental morphology, paleobotany, and ultrastructure.

The department offers courses of study leading to the degrees of Bachelor of Science in Botany, Master of Science in Botany, and Doctor of Philosophy.

**Description of Courses**

**Bot** For explanation see Index under "Symbols"

201 [B] Intermediate Botany 4 (3-3) Prereq Bio S 103. A survey of the plant kingdom; structure and function of 

232 [B] Introductory Systematic Botany 3 (1-6) II Prereq Bio S 101 or 103. Identification and classification of seed plants represented in local flora.

320 Introductory Plant Physiology 3 (2-3) I Prereq Bio S 104 or Bot 201; Org Chem. Experimental course covering water relations, mineral nutrition, photosynthesis, respiration and growth of plants.

351 Bryology 4 (2-6) II Prereq Bot 201. Systematics, evolution, and natural history of mosses and liverworts worldwide; history, literature, methods; field and laboratory experience.

380 Paleobotany 4 (3-3) I Prereq 10 hrs science. Fossil plants applied to the solution of anthropologic, botanic, climatic, and geologic problems.

410 Microtechnique 4 (2-6) II Prereq Bot 201. Methods of preparation of plant material for microscopic study.

411 Plant Morphology 4 (2-6) I Prereq Bot 201. Field trips required. Forms of land plants (bryophytes and vascular plants); the evidence for evolutionary relations of the major groups.

413 Plant Anatomy 4 (2-6) I Prereq Bot 201. Comparative study of developmental anatomy and morphology of vascular plants; economic forms.

421 General Mycology 2 (1-3) I 1970-71 a/y. Same as PI P 421.

436 Agrostology 3 (1-6) I 1970-71 a/y. Prereq Bot 232. Grasses and grasslike plants; economic importance of those in the west.

440 Cytology and Cytochemistry 3 (2-3) I Same as Genet 440.


460 Autecology 3 I Prereq Bot 320. Effects on plant growth and evolution of the following factors: soil, water, temperature, light, atmospheric, biotic, and fire.

461 Experimental Ecology 2 (0-6) II 1971-72 a/y. Prereq Bot 460. Laboratory, greenhouse, and field investigation of environmental requirements for germination and subsequent development of select species.

462 Syneccology 3 I Prereq Bot 232; 460 recommended. Structure, methods of analysis, and dynamic behavior of plant communities.

463 Field Ecology 2 (0-6) II Prereq Bot 462. Field trips required. Structure, environmental relations, and dynamism of local semidesert, grassland, and forest communities.

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

500 Seminar 1 May be repeated for credit. Prereq 20 hrs Bot.


511 (428) Mineral Nutrition and Water Relations Laboratory 1 (0-3) I Prereq Bot 320; Org Chem. Supplemental experiments to Bot 510.

512 (425) Growth and Metabolism 2 II Prereq Bot 510. Photosynthesis, respiration, growth, and reproduction.

513 (429) Growth and Metabolism Laboratory 1 (0-3) II Laboratory to accompany Bot 512. Current problems in growth relations.

514 (423) Plant Photobiology 3 II Prereq Bot 320 or Biochem. Photosynthesis and effects of visible and near-visible radiation on growth and development of plants.

515 (427) Plant Photobiology Laboratory 1 (0-3) II Prereq Bot 514 or c/. Laboratory exercises designed to accompany Bot 514.

522 Basidiomycetes 3 (2-3) II 1970-71 a/y. Same as PI P 522.

523 Ascomycetes and Fungi Imperfecti 2 (1-3) I 1971-72 a/y. Same as PI P 523.

524 Myxomycetes and Phycymycetes 2 (1-3) II 1971-72 a/y. Same as PI P 524.

527 Radioactive Tracer Techniques 2 (1-3)
II Prereq Chem 305. Use of radioisotopes in biological research.


10 Cytogenetics 3 (2-3) II Same as Genet 540.

11 Evolutionary Mechanisms 3 II 1970-71 a/y. Same as Genet 541.

50 Field Mycology 3 (1-6) S 1971 a/y. Same as PL P 550.

54 Plant Geography 3 II 1970-71 a/y. Prereq Bot 232; 460 or 462. Origin and distribution of major units of terrestrial vegetation; emphasis on North America.

55 Advanced Range Ecology 3 Prereq Bot 462. Relationship of ecological principles to the classification and use of range lands; grazing effects. Cooperative course taught at the University of Idaho.


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

40 Research, Thesis, or Examination Variable credit.

### Schedule of Studies

At least 20 of the total hours required for the bachelor's degree in this program must be in upper-division courses. The following schedule of studies is recommended. However, students' programs are individually formulated, and in some circumstances, certain requirements may be waived or substituted.

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>Introductory</td>
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<tr>
<td>Principles</td>
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<td>OTC or Elective</td>
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<th>Second Semester</th>
<th>Hours</th>
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<td>Introductory</td>
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<tr>
<td>Principles</td>
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<td>Calculus I</td>
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<td>OTC or Elective</td>
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<tr>
<td>Bot 201</td>
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<td>Chem 241</td>
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<td>Math 172</td>
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<tr>
<td>Hum or Soc S</td>
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<td>Elective</td>
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<td>P E</td>
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<td>Bot 232 Intro</td>
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<td>Chem 242</td>
<td>5</td>
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<tr>
<td>Hum or Soc S</td>
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<td>Elective</td>
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<td>P E</td>
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### Junior Year

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<tr>
<td>Bot 320</td>
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<td>Phys 201</td>
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<tr>
<td>Ger 101</td>
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<td>Hum or Soc S</td>
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<table>
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<th>Second Semester</th>
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<tr>
<td>Genet 301 and 302</td>
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<tr>
<td>Phys 202 Engineering</td>
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<tr>
<td>Ger 102 Second Sem Ger</td>
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<tr>
<td>Hum or Soc S Elective</td>
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### Senior Year

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<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>Bot 460</td>
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<td>Bot 411 or 413</td>
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<table>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tr>
<td>Bot 410 Microtechnique</td>
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<tr>
<td>Elective</td>
<td>12</td>
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</tbody>
</table>

The following courses are recommended electives: Bact 201; Biol 412; Geol 101; Cpr S 201; PL P 329; Soils 201.

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

### Preparation for Graduate Study

Before undertaking graduate study, a student should have completed substantially the equivalent of the schedule of studies shown above.

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.
Department of Business Administration


The study of business administration involves understanding and application of knowledge developed in the fields of accounting, data processing, finance and banking, general business management, insurance, marketing and sales management, personnel management, production management, retail merchandising, statistics, and transportation. Concepts from mathematics, sociology, psychology, anthropology, economics, and other disciplines are integrated in order to provide the individual with both a practical and theoretical understanding of business organization and its functions in our society. The broad education offered by this curriculum permits the student an almost unlimited range of employment opportunities in business, industry, and government.

The curricula leading to degrees in business administration at both the undergraduate and graduate levels are accredited by the American Association of Collegiate Schools of Business.

The department offers courses of study leading to the degrees of Bachelor of Arts in Business Administration, Bachelor of Arts in Hotel Administration, Bachelor of Accounting, Master of Business Administration, and Master of Arts in the Teaching of Business.

Description of Courses

BA For explanation see Index under "Symbols"

101 Introduction to Business 3 For freshmen only. Organization, functions, and activities of business with particular emphasis on the management of business enterprise.

201 Business Organization and Management 3 For nonmajors. Not open to freshmen or to students with credit in B A 101. Major business areas; management theory and practice; organization structure.

210 Law and Business I 3 Legal concepts in the business environment.

230 Principles of Accounting I 4 Freshmen permitted if specializing in accounting. The structure and interpretation of accounts and financial statements.


301 Organization and Interpersonal Relations 3 Prereq Econ 102 or 201; Soc 101 or Psych 101. Behavior in organizations as influenced by technology, organizational structure, managerial policies, supervisory patterns, individual need structure, and group relationships.

305 Real Estate I 3 Prereq B A 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.

310 Law and Business II 3 I Prereq B A 210. The impact of law and administrative and political subdivisions on the business environment.

311 Law of Commercial Transactions 3 II Prereq B A 210. Law and business directed to the needs of the CPA, CLU, and the independent businessman.

315 Statistics 4 (3-3) Prereq Econ 102 or 201; Math 201 recommended. Methods applied to business and economics.

320 Risk and Insurance 3 Prereq B A 210; Econ 102 or 201. Types of risk and methods of protection; life, property, and liability insurance.

325 Finance 3 Prereq B A 231; Econ 201 or 203; B A 315 or c// recommended. Financial decision making, financial strategies, investment in current and fixed assets, financial instruments, and capital markets.

330 Intermediate Accounting I 3 I Prereq B A 231. Theory underlying the determination of income; analysis of financial statements.
2. Managerial Accounting 3 Prereq B A 231. Analysis of budgets, internal control, cost finding, and financial statements stressing managerial use; understanding and interpretation of accounting data.
4. Cost Accounting 4 II Prereq B A 330 or 333. Management uses of cost information; cost systems and system design; cost analysis.
5. Production 3 Prereq Econ 201 or 203; Math 201; B A 315 or c//. The management process; planning, organizing, assembling resources, directing, and controlling; basic production concepts for the efficient allocation of manufacturing resources.
6. Personnel Administration 3 Prereq Econ 102 or 201; Psych 101 or Soc 101. Policy and practice in human resource utilization—selecting, training, evaluating, and compensating the work force.
7. Marketing 3 Prereq Econ 201 or 203. Functions, methods, and中间省略了部分信息。
462 Marketing Models and Decision Making 3 I Prereq Cpt S 201; Math 201; B A 315, 360. The theory and use of decision-making models in the analysis of marketing problems.

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

465 Transportation Management 3 III 1971-72 a/y. Prereq Econ 364. Problems of transporters, shippers, and associations; organization, equipment, finance, labor, services, rates, markets, and traffic functions; regulatory and legislative adjustments.

467 Methods of Marketing Analysis 3 II Prereq B A 315, 360. Survey and experimental methods in marketing research; data collection and analysis; application to selected problems.

470 Retailing Management 3 I Prereq B A 360. Retailing system; organization, merchandising models, pricing, promotion, location, and control procedures; management decision processes.

477 Promotion Management 3 Prereq B A 360. Text and case approach to integrating promotion into the marketing plan; methods, organization, communications, media selection, and campaigns.

491 Problems in Administration 3 Prereq B A 325, 340, 360, and a 400-level management course. Evaluation of overall company operations from the viewpoint of top management; decision making and administrative planning.

502 Administrative Policies: Finance 3 I The financial policies of the firm from the management viewpoint.

504 Administrative Policies: Production 3 I Technical, organizational, and structural problems from the management viewpoint.

506 Administrative Policies: Marketing 3 I Marketing policies and problems from the management viewpoint.

515 Advanced Statistics 3 I Prereq B A 315. Sampling theory and methods; correlation analysis.

516 Analysis of Time Series 3 II 1971-72 a/y. Prereq B A 315. Season, cyclical, and trend analysis; theory, construction, and uses of index numbers.

525 Analysis of Financial Problems 3 II Selected topics in business finance; emphasis on current readings.

530 Accounting Theory 3 II Recent developments with respect to the determination of income and the valuation of assets.

532 (531) Contemporary Accounting Cases and Problems 4 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.


560 Development of Marketing Thought 3 II Development and present status of marketing concepts, theory, and use of the scientific method; price policies; marketing costs and efficiency.

580 Decision Processes and Organization Theory 3 I Theories as they relate to business management.

581 Organizational Behavior in Business 3 (2-3) II Organization theory applied to business management.

591 Business Policy and Administration 3 II Theory and practice of administrative decision making and policy formulation as affected by economic, legal, and personal factors.

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

General Departmental Requirements

The schedule of studies presented below shows required courses for graduation and the sequence in which they should be taken.
hanges in sequence may be made with approval of the adviser to accommodate students specializing in certain fields and those enrolled in advanced military, except that 22 hours, or three-fourths of the General University Requirements for Graduation, are to be completed by the end of the sophomore year.

With reference to the schedule during the freshman year, the exact course or courses taken to meet the mathematics requirement will depend upon the student's previous training in mathematics, the results of the mathematics Placement Test, and the particular field of specialization chosen by the student. Math 201 and 202 are required for graduation. Math 201 may be used to meet science requirements. Six hours are required in the humanities. It is also recommended that majors take Anth 101, Psych 101, and SOC 101, but only one will be required for graduation. Psych 101 is required for students specializing in personnel administration and is recommended for those specializing in insurance and marketing and sales management.

In the junior year the student ordinarily elects a field of specialization from those set forth following the schedule. The special electives listed below for the junior and senior years must be selected from the required and suggested courses in the student's special field. The economics elective in the second semester of the junior year may be selected from any of the 300- or 400-level courses offered except in those cases where a specific course is designated in the field of specialization. The 400-level management course in the first semester of the junior year will be chosen ordinarily from B A 425, 440, 450 or 460, but again a specific requirement is designated in some fields of specialization. The electives indicated in the junior and senior years are free electives except that each student must complete a minimum of 48 hours in areas other than business administration, hotel administration, office administration, economics, P E, military science and aerospace studies. Cpt S 201 and courses taken to fulfill option requirements (e.g., Psych 306 in the Personnel Option) cannot be included as a part of the 48 hours. It is also required that the student's senior year be spent in residence. Business administration majors, taking a field of specialization other than data processing, who are interested in obtaining a high degree of competence in data processing, and who have fulfilled their mathematics requirements with Math 201 and 202 (or 107 and 171), should take as electives Cpt S 310 or 401 and 420.

Schedule of Studies

At least 43 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

**Freshman Year**

- **First Semester**
  - Engr 101 Composition 3 Hours
  - Math 201 Finite Math 3
  - Science Elective 4
  - Soc 101, Psych 101, or Anth 101 3
  - ROTC or Elective 2
  - P E 1/2

- **Second Semester**
  - Math 202 Intro Analysis 3
  - Science Elective 4
  - Hum Elective 3
  - Elective 4
  - ROTC or Elective 2
  - P E 1/2

**Sophomore Year**

- **First Semester**
  - Econ 102 Fundamentals 3 Hours
  - B A 230 Prin of Acctg 4
  - Engl 201 Intermediate Comp 3
  - B A 210 Law and Business 3
  - Hist or Pol S Elective 3
  - ROTC or Elective 2
  - P E 1/2

- **Second Semester**
  - Econ 203 Fundamentals 3
  - B A 231 Prin of Acctg 3
  - Hum Elective 3
  - Science Elective 4
  - Cpt S 201 Computer Prog 2
  - ROTC or Elective 2
  - P E 1/2

**Junior Year**

- **First Semester**
  - B A 315 Statistics 4 Hours
  - B A 360 Marketing 3
  - Econ 301 Intermediate 3
  - Elective 6

- **Second Semester**
  - B A 325 Finance 3
  - Field Economics Requirement 3
  - B A 340 Production 3
  - Special Elective* 3
  - Elective 4

**Senior Year**

- **First Semester**
  - B A 400-level management course 3 Hours
  - Special Elective* 6
  - Elective 4
Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>B A 491 Problems in Administration</td>
<td>3</td>
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<tr>
<td>Special Elective*</td>
<td>6</td>
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<tr>
<td>Elective</td>
<td>7</td>
</tr>
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* Select courses from fields of specialization. Courses printed in Roman type are required for graduation, in italics are optional.

Fields of Specialization

General Business Management
Preparation for careers in business for the student who does not wish to specialize in any of the other curricula. Students looking forward to being proprietors of their own business frequently desire a general business course.

Junior and senior years: B A 333, 301; two additional courses in economics; B A 425, 440, 450, or 460; two courses in business administration selected from any 300- or 400-level courses not otherwise required.

Accounting
Preparation for careers in public accounting, corporation accounting, and for accounting positions in government service.

Junior and senior years: B A 310 or 311*, 330, 331, 335, 338, 433 or 439; 425, 440, 450, or 460; Econ 320.

* B A 311 recommended for students planning to enter the public accounting profession.

Data Processing
Preparation in computer programming and for careers in the analysis and design of information systems in organizations where computers are an integral management tool.

Junior and senior years: B A 330; Cpt S 315 and 320; B A 417; two from B A 338, any of the 300- or 400-level Cpt S courses not otherwise required, Math 172 or 346; B A 425, 440, or 460; economics elective.

Finance
Preparation for careers in financial departments of business, commercial and investment banks, governmental financial agencies, and other financial institutions.

Junior and senior years: B A 330, 331, 425, 426; Econ 320, 340, 445; one from B A 305, 320, 335, 338, 427, 444, Econ 470.

Insurance
Preparation for careers in insurance—agency, actuarial science, claims, corporate risk management, investment, and underwriting.

Junior and senior years: B A 320, 420, 421; 425, 440, or 460; economic elective; two from B A 310, 333, 335, 367, 427, 444, Econ 312, 320, 340, 445, Of Ad 345.

Marketing
Preparation for careers in marketing management, manufacturers’ and wholesalers’ sales, retailing, and marketing research.

Junior and senior years: B A 367 or Econ 312; B A 460, 462 or 463, 467, 477; one from B A 333, 444, 470 (or 367, 462, 463 if not elected above); one from Econ 320, 364, 445, 460, 470 (or 312 if not elected above).

Personnel Management
Preparation for careers in personnel and industrial relations and the personnel aspects of government service and business.

Junior and senior years: B A 301, 350, 450; Econ 350, 450, 451; Psych 306.

Production Management
Preparation for careers as production executives in manufacturing enterprises and for other administrative positions in business and government for which production management training is useful and desirable.

Junior and senior years: B A 301, 333, 412, 440, 444; Econ 350; one from B A 338, 350, 417, 448, Psych 306, Cpt S 320.

Quantitative Methods
Preparation for careers in business and government research.

Junior and senior years: B A 425, 440, or 460; 444 or 448; Cpt S 300- or 400-level course; economics elective; one from B A 462, 467, 471, Math 360 (or B A 412, 415, 419, 444, 448 if not otherwise elected); two from B A 412, 415, 419.

Teaching
The requirements for teaching business subjects in high schools and junior colleges are described in the section of this catalog devoted to the Department of Education. Major and minor teaching preparations are indicated for those preparing to teach bookkeeping and clerical subjects. Those persons completing the bookkeeping-clerical-general business major, plus the other requirements for certification, will qualify for the degree of Bachelor of Arts in Business Administration.
transportation

Preparation for careers with air, highway, peline, railroad, and water carriers, with uffic departments of agricultural and industrial concerns, chambers of commerce, research organizations, and with government agencies aling with transportation problems.

Junior and senior years: Econ 320, 364; 33, 464, or 465; B A 465; 425, 440, or 460; ro from B A 301, 333, 463, Econ 340, 350, 50, 470.

Second Bachelor's Degree

udents who have received a bachelor's degree in arnother area may obtain a bachelor's degree in business administration by presenting total credits of at least 150 hours and by filling the following departmental requirements: B A 210, 230, 231, 315, 325, 340, 350; Econ 102 or 201, 203, 301; Engi 201; pt S 201; Math 201 and 202; a 300-level course in Econ or B A; two 400-level courses B A. 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.

Accounting Five-Year Curriculum

his curriculum permits the student to obtain greater proficiency in accounting than does the regular four-year program, while at the same time permitting him to supplement and broaden his educational experience.

Upon completion of the curriculum with a total of 150 hours of credit, the student will receive two degrees: Bachelor of Arts in Business Administration and the five-year Bachelor of Accounting. The following sequence of courses will enable the student to receive the bachelor of Arts in Business Administration at the end of the fourth year and the Bachelor of Accounting at the end of the fifth year:

Junior and senior years: B A 311, 330, 31, 335, 338, 433; Econ 320; B A 440, 50, or 460.

Fifth year: B A 430; 415, 431, or 444; 25 or 427; 439; Econ 340; Cpt S 320.

Electives in this program should be taken outside the Departments of Business Administration and Economics.

Transfer Students

udents planning to transfer to Washington State University at the end of the freshman or sophomore year should follow as closely as possible the schedule of studies 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 other institutions during the freshman and sophomore years that are numbered 300 or above at Washington State will not be accepted for major requirements.

Preparation for Graduate Study

programs of study leading to the Master of Business Administration degree may be taken in several fields of specialization: accounting, finance, industrial relations, marketing, production, statistics, and transportation. If the following courses are not completed prior to entering the graduate program, they will be considered to be deficiency courses: B A 210, 230, 231, 315, 325, 340, 360; Econ 102, 203. Econ 301 must be taken either as a deficiency course or as a part of the graduate program.

Department of Chemical and Nuclear Engineering

Professor and Chairman of the Department, G. T. Austin; Professor, H. Stern; Associate Professor, R. Luedeking; Assistant Professor, G. Jensen; Adjunct Associate Professor, B. M. Johnson; Adjunct Assistant Professor, P. L. Hofmann.

The curriculum in chemical engineering provides thorough knowledge of basic science and engineering and intensive training in the field of knowledge that characterizes the chemical engineer as a professional man. This includes material and energy balances, chemical and physical equilibria, rate processes, and economic balances. With such training, a graduate may participate in the design of large-scale equipment for chemical manufacturing plants or he may engage in research leading to new or improved chemical processes, products, and uses. If he is so inclined, he 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 Engineers Council for Professional Development.

The department offers courses of study leading to the degrees of Bachelor of Science in
Chemical Engineering and Master of Science in Chemical Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy (Engineering Science).

**Description of Courses**

Ch E For explanation see Index under "Symbols"

110 Chemical Engineering Orientation 1 (0-3) I Engineering as a profession; methods and procedures used in engineering calculations, planning, and reports.

201 Elementary Chemical Engineering 3 I Prereq 6 hrs general Chem; Math 107. Exercises in industrial calculations necessary for the design of chemical plants.

202 Material and Energy Balances 3 II Prereq Ch E 201. Material and energy balances, physical equilibria, and industrial calculations.

204 Analog Computation 1 (0-3) Prereq Math 172. Theory and operation of analog computers.

301 Unit Operations 4 I Prereq Ch E 202. Quantitative relations in design, operation, and evaluation of equipment used in fluid flow, heat transfer, filtration, evaporation, crushing, and classification.

302 Unit Operations II Prereq Ch E 301. Extraction, distillation, absorption, and drying.

316 Reactor Laboratory 2 (0-6) II Prereq Chem 102; Math 171. Fundamentals of reactor operation, radiation protection, Federal regulation; use of 1000 kw reactor for familiarization experiments and operator training.

401 Unit Operations Laboratory 2 (0-6) I Prereq Ch E 301.

402 Unit Operations Laboratory 2 (0-6) II Prereq Ch E 302.

403 Chemical Engineering Laboratory 2 (0-6) II Prereq Math 172; senior standing in Engr or Ph S. Unit operations used in nuclear technology, heat transfer, fluid flow, liquid-liquid extraction, ion exchange, evaporation, and distillation.

406 Industrial Chemical Processes 3 II Prereq Chem 242. The chemistry, chemical engineering, and economics involved in modern chemical process industries.

407 Chemical Engineering Thermodynamics 3 I Prereq Ch E 202; Chem 332. Definitions, basic concepts, and laws; property relationships; construction of thermodynamic charts and tables; compression and liquefaction of gases, power cycles, refrigeration.

409 Industrial Instruments 3 I Prereq Math 172; Phys 202. Measuring instruments, automatic control, process and instrument characteristics, and theory applied to industrial control problems.

414 Introduction to Nuclear Engineering 3 I Prereq senior in Engr or Ph S. Brief review of nuclear physics and radiation calculations; conceptual design of a nuclear reactor core and shielding using basic formulations of nuclear engineering.

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

503 Heat Transmission 3 Prereq Ch E 301 or Math 273. Conduction, radiation; convection in flowing fluids, condensing vapor, and boiling liquids, packed and fluidized beds, and design of equipment.


512 Rate Processes 3 II 1971-72 a/y. Prereq Ch E 302 or Math 273. Transport phenomena and other rate processes.

514 Nuclear Engineering 2 II Prereq Ch E 414; Chem 305. Reactor theory applied to core designs diffusion and multiplication of neutrons under steady state and transient conditions, and reactor control.

516 Nuclear Engineering Laboratory 2 (0-6) II Prereq Ch E 414. Detection and measurement of phenomena involving neutrons in reactor assemblies; applications of theory of neutron distribution and control.

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

600 Research, Thesis, or Examination Variable credit.

**Schedule of Studies**

At least 36 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>Semester</th>
<th>Hours</th>
<th>Course</th>
<th>Credits</th>
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<td>Ch E 407 Thermodynamics</td>
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<td>C E 314 Mech of Materials</td>
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<td>Technical Elective ²</td>
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Notes:
- ¹Students with B or better in high school chemistry and superior Math Placement test scores should substitute Chem 111 and 212 for Chem 105, 106, and 217. Students offering Chem 101 and 102 or equivalent transfer credit must elect Chem 120 before Chem 217.
- ²A technical subject approved before enrollment by the department chairman.
- ³Ch E 503, 505, 512, 514, or 516 may be taken if the student registers in the Graduate School.
- ⁴Must 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 (except those institutions accredited by the ECPD) should plan on spending three years at Washington State to earn the bachelor's degree. This is desirable because of sophomore professional courses and the necessity for good preparation in mathematics. Such transfer students should complete courses equivalent to Math 171 and 172.

**Preparation for Graduate Study**

As preparation for work toward an advanced degree, a student should have completed, or must make up without graduate credit, the following: 6 hours each of physics, calculus, and organic chemistry; 4 hours of electrical engineering; 3 hours each of differential equations, engineering mechanics, strength of materials, unit processes, and chemical engineering thermodynamics; 2 hours each of stoichiometry and unit operations laboratory; 1 hour of analog and 2 hours of digital computer use. A Bachelor of Science degree in Chemical Engineering from an institution accredited by ECPD normally will satisfy this requirement.
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 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 between molecules as well as by solids. Use is made of quantum theory and statistical mechanics in the theoretical studies. Typical experimental techniques are those of electron, x-ray, and neutron diffraction; spectroscopic methods over most of the range of the electromagnetic spectrum; and molecular, ionic, and electron beam techniques. Computers are often used in both the theoretical and experimental investigations.

The interdisciplinary nature of the program is stressed which allows the student a certain amount of flexibility to meet his needs and interest; however, all students will be expected to complete courses in thermodynamics and statistical mechanics, quantum theory, and atomic and molecular structure.

The research interests of the members of the chemical physics program show great variety. At present there are investigations involving NMR and NQR studies of structure, motion and bonding in crystals, fast reactions, quantum mechanics of lattices, infrared and Raman spectroscopy of solids, surface physics, interatomic interactions in crystals, molecular quantum mechanics, computation of physical properties for small molecules, x-ray and neutron crystallography, stereochemistry and valence, magnetic and optical properties of solids, inelastic collisions of molecules with atoms, ions, and other molecules and surfaces.

Students may obtain a Bachelor of Science degree in chemistry or physics with a concentration in chemical physics. 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

Ch P For explanation see Index under "Symbols"

434 Chemical Physics Laboratory 2 (0-6) II Prereq Ch P 461 or c/. Experiments in solid state, surface physics, and molecular structure; contemporary research in chemical physics.

461 Atomic and Molecular Phenomena 3 I Same as Phys 461.

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

538 Special Topics in Chemical Physics 2 or 3 May be repeated for credit. II Selected subjects in molecular structure, spectroscopy, solid state, and surface physics.

590 Seminar 1 May be repeated for credit.

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

600 Research, Thesis, or Examination Variable credit.

Department of Chemistry


Chemistry is the fundamental science that deals with the nature of substances and the changes occurring in them. Through the study of chemistry, the student can acquire knowledge that will give him greater understanding and appreciation of the world in which he lives. An undergraduate major in chemistry
biochemistry can lead to graduate research
in these and many related fields or to an ap-
plication of the training in various positions
in government, industry, and education.

The department has excellent facilities and
special equipment for graduate study and re-
search. There are active research programs
in analytical chemistry (electrochemical rea-
ctions in aprotic solvents; computer calculation
of formation constants; coulometry, polarogra-
phy, and chronopotentiometry; neutron activa-
tion analysis); biochemistry (enzyme kinetics;
fluorescence, ORD/CD, isotopic tracer, and
substrate analog studies of enzyme mechanisms;
NMR study of organic binding to biological com-
ounds; metabolic pathways in microorgan-
isms; biochemical control mechanisms; bio-
chemistry of development in insects; evolution
of enzyme molecules; biochemical genetics in-
cluding cytoplasmatic mechanisms; protein bio-
synthesis and regulation of plant growth; bio-
physical chemistry of macromolecules); inorga-
nic chemistry (kinetic and isotopic studies of
reaction mechanisms; stereochemistry of co-
ordination compounds; synthetic chemistry;
transition metal compounds with olefins and
acetylenes; NMR studies of stereochemistry and
the nature of metal-ligand bonds); organic
chemistry (boron-carbon compounds; mechan-
sis of molecular rearrangements; secondary
leukemia isotope effects; metal isocyanide
complexes; polypeptide chemistry; reaction ki-
etics and stereochemistry; ring-chain tauto-
nomerism; synthetic medicinal chemistry; redox
behavior of aldehydes); and physical chemis-
try (theories of valence and chemical bonding;
molecular and crystal structure by infrared,
tamam, x-ray and neutron spectroscopy; nuclear
magnetic and nuclear quadrupole resonance;
nuclear decay scheme studies; study of
ast reactions by NMR, tracer, and angular
orrelation techniques; magnetic susceptibility
studies; colloid science; sedimentation poten-
ials; molecular quantum mechanics; mechan-
isms of inter- and intramolecular energy trans-
fer in solids).

Washington State University is on the ap-
proved list of the American Chemical Society.

The department offers courses of study lead-
ing to the degrees of Bachelor of Science in
Chemistry, Bachelor of Science in Biochemis-
try, Master of Science in Chemistry, Master
of Arts in the Teaching of Chemistry, and
Doctor of Philosophy (Chemistry).

A student will begin the study of chemistry
with Chem 101, 105, or 111, depending on
his preparation. (A new student, who has
had no previous college chemistry, should
ake the Placement Examination in Chemistry
prior to registration.) In order to take courses
in chemistry above the 100-level, he must
complete one of the following sequences:
Chem 101, 102 and 120; 105 and 106; 111
and 212.

An interdisciplinary program in Chemical
Physics has been established, providing special
opportunities for those students whose inter-
ests span the areas of chemistry and physics.
See the Chemical Physics section in this bul-
tin.

Credit Limitations
Credit in only one of the chemistry courses in
each of the following groups will be given:
(a) 101, 105, 111; (b) 102, 106, 212; (c)
217, 221; (d) 240, 241.

Description of Courses
For explanation see Index under "Symbols"
General and Inorganic Chemistry

Chem

101 [P] Introductory Chemistry 4 (3-3)
Prereq satisfactory Math Placement Test
score. Atomic structure and periodic
Table; properties of gases, liquids, sol-
ids, solutions; stoichiometry and energy
relationships; chemical equilibrium;
ionization.

102 [P] Introductory Chemistry 4 (2-6)
Prereq Chem 101. Oxidation-reduction;
titrations; qualitative analysis; metal-
lurgy; a brief introduction to electro-
chemistry, colloids, nuclear chemistry,
and organic chemistry.

105 [P] Principles of Chemistry 4 (3-3)
Prereq 1 yr high school Chem; 3 yrs
high school Math; satisfactory Math
Placement Test score. Stoichiometry,
structure, chemical energy relationships,
equilibrium, kinetics, qualitative, and
gravimetric analysis.

106 [P] Principles of Chemistry 4 (2-6)
Prereq Chem 105 or 111. Ionic, mo-
olecular, solubility, and redox equilibria;
electrochemistry; coordination compo-
sounds; systematic chemistry of the
elements; volumetric analysis; nuclear
chemistry and radiochemistry.

111 [P] General-Quantitative Chemistry
Honors 5 (3-6) 1 Prereq 1 yr high
school Chem with grade of B or bet-
ter; superior Math Placement Test score.
A combined course covering general
chemistry and quantitative analysis.

120 Quantitative Chemical Concepts 2 Pre-
req Chem 102 or c/. The use of
mathematical concepts in chemistry.

305 Introduction to Radiochemistry 3 (2-3) I Prereq Chem 106 or 120, or 212; Phys 202. Radioactivity applied to the physical and biological sciences.

401 Modern Inorganic Chemistry 3 I 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.

402 Experimental Inorganic Chemistry 2 (0-6) I 1971-72 a/y. Prereq Chem 332. Preparation of inorganic compounds selected to illustrate more advanced methods employed in research.

405 Nuclear Chemistry 2 II 1971-72 a/y. Prereq Chem 332 or c//; Phys 303 or 405. Nuclear reactions and structure; radioactive decay; interactions of radiation with matter; techniques for studying radio nuclides.


503 Advanced Topics in Inorganic Chemistry 3 May be repeated for credit. I Prereq Chem 502. Recent significant developments.

Analytical Chemistry

Chem

217 Quantitative Analysis 4 (2-6) Prereq Chem 106 or 120. Analytical chemistry of the more common elements; acid-base, solubility, and redox equilibria treated in lecture and applied in laboratory.

221 Quantitative Analysis 4 (2-6) I Prereq Chem 106. For Chem and related science majors.

424 Activation Analysis 2 (1-3) II Principles and methods of neutron and charged particle activation analysis and applications.

425 Advanced Analytical Chemistry 4 (2-6) II Prereq Chem 212, 217 or 221; 332. Principles and applications of modern analytical methods including chromatography, spectrophotometry, polarography, potentiometry, and high-frequency techniques.

522 Principles of Chemical Analysis 2 II Prereq Chem 332. Chemical equilibria in aqueous and non-aqueous systems; chelation titrations; oxidation-reduction; multistage separations; statistical treatment of chemical data; sampling.


Physical Chemistry

Chem

331 Physical Chemistry 4 Prereq Chem 212, 217, or 221; Math 172; Phys 202. Concepts of physical chemistry; thermodynamics, kinetics, properties of electrolytes, energy states of matter, and statistical thermodynamics.

332 Physical Chemistry 3 II Prereq Chem 331; Math 220; c// in Chem 333. Quantum theory of matter; molecular structure and spectra, elementary bonding theory, theory of reaction rates, photochemistry, and radiation chemistry.

333 Physical Chemistry Laboratory 1 (0-3) II Prereq Chem 331. Experiments selected to meet the individual needs of students in Chem, C E, Met, Biochem, or Bio S.

334 Physical Chemistry Laboratory 1 (0-3) Prereq Chem 332, 333. Experiments in molecular structure, electrochemistry, kinetics, thermodynamics, and other areas of physical chemistry.

430 Ultraviolet and Visible Spectroscopy 2 I Same as Bio P 430.

431 Directed Studies in Physical Chemistry 3 I Prereq elem phys chem. Review and extension of basic concepts of classical physical chemistry; individual study.

432 Magnetic Resonance 2 II Same as Bio P 432.


434 Colloid and Surface Chemistry 2 II 1971-72 a/y. Prereq Chem 331. Properties of colloidal systems, including macromolecular solutions, and of surfaces and interfaces; experimental methods; interpretation of data; applications.


and electrochemical cells; irreversible processes in solution.

531 Advanced Physical Chemistry 3 I Prereq Chem 332. Methods of quantum chemistry; atomic and molecular structure; chemical bonding; chemical statistical mechanics; kinetics of chemical change.

532 Thermodynamics 3 II Prereq Chem 331. Fundamental theory and applications.


537 Advanced Topics in Physical Chemistry 2 May be repeated for credit. I Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction.

539 Group Representation Theory and Applications 3 Same as Math 539.

Organic Chemistry

Chem

240 Elementary Organic Chemistry 4 (3-3) Prereq Chem 106 or 120 or 212.

241 Organic Chemistry 5 (3-6) Prereq Chem 106 or 120, or 212.


445 Organic Reactions 2 I Prereq Chem 242. Consideration of selected organic reactions including mechanism at an intermediate level.

446 Modern Techniques of Organic Chemistry 3 (1-6) II Prereq Chem 242, 331. Preparation and characterization of organic compounds by modern methods; interpretation of infrared, ultraviolet, mass, and nuclear magnetic resonance spectra.


543 Theoretical Organic Chemistry 3 I Prereq Chem 541. Relationship of reactivity to molecular structure; mechanisms of organic reactions.


Biochemistry

Chem

364 Introductory Biochemistry 3 Prereq Chem 240 or 242. Modern biochemistry primarily for undergraduates in the biological sciences.

366 Biochemistry Laboratory 1 (0-3) Prereq Chem 364 or c//. Basic biochemical techniques.

463 General Biochemistry 3 I Prereq Chem 212 or 217; 242. Fundamental principles; major areas of biochemistry.


466 Biological Techniques 3 (1-6) II Prereq Chem 464 or c//. Advanced research methods.

560 Molecular Genetics 3 I Same as Genet 560.

564 Physical Chemistry of Biological Macromolecules 3 II 1970-71 a/y. Prereq Chem 436. The forces determining structure; application of equilibrium and non-equilibrium thermodynamics.


568 Advanced Topics in Biochemistry 2 May be repeated for credit. II Prereq Chem 464. Recent research in selected areas of biochemistry.

Problems, Seminar, and Research and Thesis

Chem

398 Undergraduate Seminar 1

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

591 Seminar 1

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

600 Research, Thesis, or Examination Variable credit.
## Schedule of Studies

### Chemistry

At least 21 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 chairman to arrange a schedule which will permit him to complete required courses in proper sequence.

### Freshman Year

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<td>Phys 202 Class Phys</td>
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<td>Engl 201 Inter Comp</td>
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### Junior Year

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<td>Chem 242 Organic</td>
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<td>Chem 243 Organic Lab</td>
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<td>Ger 101 First Semester</td>
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<table>
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<tr>
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### Senior Year

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<tr>
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<td>Chem 401 Inorganic</td>
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</table>

<sup>1</sup>Highly qualified students are encouraged to take Chem 111, 212 in place of Chem 105, 106, 221. Students who have taken Chem 101, 102 must take Chem 120.

<sup>2</sup>Electives must include 6 hours in chemistry selected from the following: one course from Chem 402, 446, and 499; one from Chem 403, 430, 431, 432, 433, 434, 435, and 436; one course in physics or mathematics requiring the use of calculus may be substituted for an advanced course in chemistry.

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

## Schedule of Studies

### Biochemistry

This schedule of studies is designed for the student with an interest in the chemistry of biological systems, and affords an opportunity for a good background in biology as well as in chemistry. A student undertaking this curriculum after the beginning of the freshman year should consult with the department chairman to arrange a schedule which will permit him to complete required courses in proper sequence.

At least 26 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

### Freshman Year

<table>
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<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>Chem 105 Principles&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>Bio S 103 Introductory</td>
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<tr>
<td>Engl 101 Composition</td>
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<td>ROTC or Elective</td>
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<tr>
<td>Sophomore Year</td>
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<tr>
<td><strong>First Semester</strong></td>
<td><strong>Hours</strong></td>
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<tr>
<td><strong>Second Semester</strong></td>
<td><strong>Hours</strong></td>
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<td>Chem 242 Organic</td>
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<td>Chem 243 Organic Lab</td>
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<td>Phys 202 Class Phys</td>
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<td>Math 172 Calculus II</td>
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<td>Math 220 Linear Alg</td>
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<td>Ger 101 First Semester</td>
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<td>Bio S Elective</td>
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<thead>
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<th>Senior Year</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>Chem 331 Physical</td>
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<td>Chem 469 Biochemistry</td>
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<tr>
<td>Chem 398 Seminar</td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>Chem 332 Physical</td>
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<tr>
<td>Chem 333 Physical Lab</td>
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<tr>
<td>Chem 466 Biochemistry</td>
</tr>
<tr>
<td>Ger 203 Third Semester</td>
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<tr>
<td>Approved Elective</td>
</tr>
</tbody>
</table>

1Highly qualified students are encouraged to take Chem 111, 212 in place of Chem 105, 106, 221. Students who have taken Chem 101, 102 must take Chem 120.

2Gener 301 and one or two courses in physiology, ordinarily selected from Bot 424, 425; Zool 352, 353.

3Including one course from Chem 425, 446, 466, and 499.

Courses printed in Roman type are required for graduation, 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. He should also present 8 hours of physics, mathematics through calculus, and have a reading knowledge of scientific German.

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

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**Department of Child and Family Studies**

*Associate Professor and Chairman of the Department, Mary O. Gallwey; Associate Professor, A. Jean Erwin; Assistant Professors, M. L. Hamilton, Dale W. Kaiss, Dorothy Z. Price, Louise M. Windbusen; Instructors, Emma L. Kenzy, Betty C. Scott.*

This curriculum is designed for the student whose major concern is the development and welfare of the individual within a family setting. The program focuses on the normal physical, social, and psychological development and understanding of the child and the functioning of the family. The content of the program is derived from and integrates relevant knowledge in such basic fields as anthropology, biology, economics, home economics, philosophy, psychology, and sociology.

The department offers three major options. The course of study in home management, combined with appropriate electives, prepares students for a variety of positions with public and private social welfare agencies, junior research in government management, consumer education, and financial writing and consulting. It also provides preparation for graduate work leading to college teaching, research, or administrative positions in welfare, government, or education. The Nursery School Option offers preparation for marriage and family living, training for professional work in nursery education, and education for a variety of social services concerned with children and...
families. The Professional Preparation Option provides basic preparation for graduate study and research in child development and family life education leading to a variety of positions in higher education, government, and social agencies in teaching, research, or administration.

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 degree of Bachelor of Arts in Home Economics. The department participates with the Departments of Education, Psychology, Sociology, and Speech in offering a course of study leading to the degree of Master of Arts in Child Development.

**Description of Courses**

*For explanation see Index under "Symbols"*

**Child Development**

**CFS**

240 Child Development and Guidance 3
Prereq Psych 101; CFS 242 or C/.
Not open to students who have taken Educ 201. Principles of child behavior and development; guidance of young children.

242 Directed Observation 1 (0-3) Prereq Psych 101. Observational techniques; observation and participation in nursery school.

247 Family Relationships 3 Prereq Psych 101; Soc 101. Development and interaction of individuals and families as influenced by psychological and sociological variables.

342 Nursery School Curriculum 3 (2-3) Prereq CFS 240 or Educ 201. Art; music; science; and literature experiences for preschool children.

344 Guidance of Young Children 3 (2-3) Prereq CFS 240 or Educ 201. Preschool education; participation in the guidance of young children.

401 Practice in Nursery Education 2 (0-6) Prereq CFS 342 or 344. Theory applied to teaching in the nursery school.

402 Practice in Nursery Education 2 (0-6) Same as CFS 401.

440 Advanced Child Development 2 or 3 (2-3) Prereq CFS 240 or Educ 201; CFS 247. Theory and recent research in child development.

442 The Child and Family in Poverty 3 Prereq Psych 101; Soc 101. Extent and distribution of poverty and deprivation; social psychology of poverty; effects on individual development and family functioning; remedial programs.

446 Practice in Nursery School Education 2 (0-6) or 4 (0-12) May be repeated for 4 or 8 hours of credit. Prereq CFS 342. Theory applied to teaching in the nursery school.

447 Advanced Family Relationships 2 II Prereq Soc 351. Family life research applied to family living situations.

448 Parent Education 3 (2-3) Prereq CFS 240 or Educ 201; CFS 247. Child development and family relationships applied to individual and group work with parents.

449 Seminar in Child Development 1 May be repeated for credit. Prereq CFS 240.

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

540 Social Learning in Children 3 I Prereq 12 hrs C D or Psych. Social influences and the development of motivation and emotion; attitudes, values, and interests; relations with peers.

541 Professional Practice in Child Development 1 I Required during first year of candidacy. Disciplines contributing to child development; observation of programs for children with special characteristics.

542 Seminar in Developmental Research 3 I Prereq 6 hrs child development. Methodology in developmental research; current research topics.

549 Seminar in Child Development 1 May be repeated for 4 hours credit.

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

600 Research, Thesis, or Examination Variable credit.

**Home Management**

**CFS**

350 Decision Making in Families 3 Prereq CFS 247 or 9 hrs Soc 8; Econ 201 or 203 recommended. Integrated nature of management in families; role of values in decision making.

352 Consumer Buying 3 Prereq Econ 201 or 203; CFS 350 recommended. Consumer practices and problems; evaluation of consumer information and protection.

353 Family Housing 3 Housing requirements as influenced by family activities, interests, and socio-economic status.
450 Home Management Laboratory 3 (1-6)  

452 Family Financial Problems 3 I Prereq  
Econ 201 or 203; CFS 350. Role of  
the family in the economy; effect of  
social, economic, and political changes  
on the family's financial management.

550 Advanced Home Management 2 II  
1970-71 a/y. Prereq CFS 350; 12 hrs Soc  
S. Development and present status of  
theory in home management; research  
trends and needs.

552 Family Consumption Behavior 3 II  
1971-72 a/y. Prereq Econ 201 or 203;  
CFS 352, 452, or Econ 312 and 3  
aditional hrs Econ. Consumer decisions  
as affected by psychological, sociologi-  
cal, and economic factors.

**Schedule of Studies**

**Home Management Option**

At least 42 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>Engl 101 Composition</td>
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<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
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<td>FNIM 130 Nutrition</td>
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<td>Math Elective</td>
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<td>Pol S 101 or Elective</td>
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<tr>
<td>C T 107 Design Analysis</td>
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<td>Bact 101 Elementary</td>
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<td>Phil 101 Introduction</td>
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<td>Elective</td>
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**Sophomore Year**

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<td>CFS 247 Family Relationships</td>
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<tr>
<td>Psych 201 Prin of Behavior</td>
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<td>Ph S 101 or Chem 101</td>
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<td>CFS 242 Dir Observation</td>
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<td>Zool 251 Intro Hum Physiol</td>
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<td>C T 215 Textiles</td>
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**Junior Year**

**First Semester**

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<tr>
<td>CFS 350 Decision Making</td>
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<td>Anth 358 Culture and Personality</td>
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<td>CFS 353 Family Housing</td>
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**Second Semester**

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<tr>
<td>CFS 352 Consumer Buying</td>
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<td>C T 417 Social Aspects</td>
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<td>FNIM 334 Family Food Mgt</td>
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<td>Soc 351 The Family</td>
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**Senior Year**

**First Semester**

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<td>Econ 312 Consumption</td>
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<td>Psych 350 Social Psych</td>
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**Second Semester**

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<td>CFS 450 Home Mgt Lab</td>
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<td>CFS 447 Family Relationships</td>
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<td>CFS 442 Poverty</td>
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<td>Phil 330 Ethics</td>
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Suggested electives: Biom 310; B A 315,  
375; Com 101; Econ 301, 320, 340; H E  
401; Math 201; Phil 201; Psych 285, 307,  
311, 390, 431; Spe 325; Soc 270, 321, 330,  
340, 451; S W 290, 390, 490.

*Students who received a grade of A or B  
in Engl 101 are exempt from this require-  
ment.

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

**Nursery School Option**

At least 39 of the total hours required for the  
bachelor’s degree in this program must be in  
upper-division courses.

**Freshman Year**

<table>
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<tbody>
<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Psych 101 Prin of Behavior</td>
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<td>FNIM 130 Nutrition</td>
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<td>C T 107 Design Analysis</td>
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**Second Semester**

<table>
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<tr>
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<tbody>
<tr>
<td>Soc 101 Introduction</td>
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<td>CFS 120 or 121</td>
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<tr>
<td>Psych 101 Prin of Behavior</td>
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<td>Ph S Elective</td>
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### Sophomore Year

<table>
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<td>CFS 242 Dir Observation</td>
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<td>FNIM 266 Household Equip</td>
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<tr>
<td>Second Semester</td>
<td>CFS 247 Family Relationships</td>
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<td>Zool 251 Intro Hum Physiol</td>
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<td>Nurs 121 Home Nursing</td>
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### Junior Year

<table>
<thead>
<tr>
<th>Period</th>
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<tbody>
<tr>
<td>First Semester</td>
<td>CFS 342 Nursery School</td>
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<td>Soc 351 The Family</td>
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<td>CFS 350 Decision Making</td>
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<td>Anth 358 Culture and Personality</td>
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<td>CFS 344 Child Guidance</td>
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<td>Mus 390 Materials and Methods</td>
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<td>CFS 447 Family Relations</td>
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### Senior Year

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<th>Course</th>
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<tbody>
<tr>
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<td>CFS 440 Child Development</td>
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<td>CFS 446 Nursery School</td>
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<tr>
<td>Second Semester</td>
<td>CFS 448 Parent Education</td>
<td>3</td>
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<td></td>
<td>CFS 446 Nursery School</td>
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<td>CFS 442 Poverty</td>
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*Students who received a grade of A or B in Engl 101 are exempt from this requirement.

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

### Professional Preparation Option

At least 38 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>Period</th>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>


*Students who received a grade of A or B
n Engl 101 are exempt from this requirement.

Courses printed in Roman type are required or graduation, in italics are optional.

Transfer Students
Transfer students should note the sequence of professional requirements.

Child Development
Associate Professor and Adviser, Mary Galloway; Professors, W. Beasley, K. E. Lloyd, F. T. Marcus, F. I. Nye; Associate Professors, R. Franks, Inga K. Kelly; Assistant Professors, M. L. Hamilton, R. E. Potter.

The degree of Master of Arts in Child Development is offered through an interdepartmental committee on childhood programs including representatives from the Departments of Child and Family Studies, Education, Psychology, Sociology, and Speech. The curriculum is designed to provide a broad background through course work in each of several areas contributing to an understanding of the development and functioning of children and families in a variety of settings.

Students enrolled in the curriculum may concentrate in any one of the areas represented by the cooperating departments. It is expected that students who have not had an undergraduate course in statistics will remove his deficiency by course work or examination.

Course work will include: CPS 342 or 44, 442, 541, 599 or 600; Educ 457; Psych 664; Soc 554; Spe 370.

Department of Civil Engineering

The objective of the course 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 to advantage any line of civil engineering practice. The broad fields of civil engineering practice may be designated as follows: topographic and geodetic engineering, transportation engineering, irrigation and hydraulic engineering, sanitary (environmental health) engineering, municipal engineering, structural engineering, and construction engineering.

The curricula in civil engineering in the College of Engineering are accredited by the Engineers Council for Professional Development.

The work in surveying for civil engineers is done at Camp F. W. Welch, the summer survey camp of Washington State University at Clear Lake, near Naches, Washington. Attendance at one summer camp is required.

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 Hydraulic Engineering, Master of Science in Sanitary Engineering, and Master of Science in Structural Engineering. The department participates in the interdepartmental programs leading to the degrees of Master of Science in Environmental Science and Doctor of Philosophy (Engineering Science).

Description of Courses
C E For explanation see Index under "Symbols"

101 Introduction to Surveying 3 (1-6) Prereq Math 107; Arch 161 or M E 101.

110 Civil Engineering Orientation 1 (0-3) For freshmen only. Activities, employment, and professional ideals and ethics in engineering; methods and procedures for elementary calculations.


211 Statics 3 Prereq Math 171.

212 Dynamics 3 Prereq C E 211.

221 Transportation Engineering 2 Prereq sophomore standing. Transport technology; factors of operation; planning for use and development.

301 Engineering Surveys 4 (1-9) S Prereq C E 201, 221.


314 Mechanics of Materials 3 Prereq C E 211 or 213.

315 Mechanics of Fluids 3 Prereq C E 212 or 213. Principles of fluid statics and kinetics.

316 Fluid Mechanics Laboratory 1 (0-3) Prereq C E 315. Experiments illustrating principles of fluid mechanics.

317 Soil Mechanics 3 (2-3) Prereq C E 310, 314, or c/; Geol 101. Characteristics and properties of soils; soil pressure and bearing-stresses in earth masses; identification tests and strength determination.

321 Highway Engineering 2 Prereq C E 301. Planning, cost analysis, right-of-way; driver vehicle and road characteristics; traffic, drainage, sub-grades, bases; pavements, airport planning.

330 Mechanics of Structures 5 (4-5) Prereq C E 310 or 314. Algebraic and graphic solutions, influence lines, and moving loads; introduction of statically indeterminate structures; matrix formulation.

341 Environmental Health Engineering 4 (3-3) Prereq junior standing. Environmental health, water and waste water treatment principles, and water and waste water analysis.

350 Hydrology 2 Prereq junior standing.


422 Advanced Highway Engineering 3 (2-3) II Prereq C E 321. Design of flexible and rigid pavements.

424 Traffic and Transportation 3 (2-3) II Prereq C E 301. Traffic counts, intersection design, and regional transportation problems.

431 Design of Steel Structures 3 (2-3) Prereq C E 330. Principles of riveted and welded design.

433 Reinforced Concrete 3 Prereq C E 330. Analysis and design of structures; conventional and ultimate strength theories.

434 Reinforced Concrete 3 II Prereq C E 433 or 472. Continuation of C E 433. Limit design; prestressed concrete.


436 Design of Timber Structures 2 I Prereq C E 330 or c/.. Analysis and design.

437 Statically Indeterminate Structures 3 I Prereq C E 330. Indeterminate structures, multistory frames, and haunched beams.


452 Hydraulics of Irrigation 3 II Prereq C E 315. Engineering layout and design of irrigation systems.

453 Water Resources Engineering 3 I Prereq C E 350 or graduate standing. River basin development from an engineering viewpoint.

463 Engineering Administration 2 Principles of engineering economy; specification writing; cost estimating; engineering contracts.

464 Construction Management 3 II Prereq senior standing. Job scheduling, job planning, project control, records and policies, and construction equipment.

471 Structural Design for Architects 4 I Prereq C E 350. Structural design in steel and concrete; specification and building codes.

472 Structural Design for Architects 4 (2-6) II Prereq C E 471. Structural design in prestressed concrete and timber; comprehensive problems.

497 Seminar 1 I Prereq senior standing. Engineering reports, ethics, and the profession.

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

512 Dynamics of Structures 2 II Prereq C E 330; Math 273. Behavior of structures under impact, impulse, and seismic loads.

513 Theory of Elastic Stability 2 II Prereq C E 330; Math 273. Stability analysis of uniform bars and structural frames by solution of differential equations; energy approximations.

514 Advanced Mechanics of Materials 3 I Prereq C E 330; Math 273. Stresses and strains; unsymmetrical bending; curved beams; beams on elastic foundations; thin plates and shells; Maxwell's reciprocal theorem.

with extensive application to portland cement concretes, bituminous concretes, and their constituents. Cooperative course taught at the University of Idaho.

Advanced Soil Mechanics 3 II Prereq C E 317. Soil interaction and deflection with shallow beams, bearing capacity, compaction, settlement, and performance of individual piles and seepage forces. Cooperative course taught at the University of Idaho.

Advanced Theory of Structures 3 I Prereq C E 437.

Advanced Structural Design 3 (2-3) II Prereq C E 431, 433.

Theory of Plates and Shells 3 II Prereq C E 514. Mathematical theories of plate and shell solutions; plates of various shapes; large deflections, buckling of plates; membrane theory of shells.

Environmental Health Engineering Analysis 3 (1-6) S Prereq C E 341, 583. Theory and methods of analysis of water, waste water and air; electrometric, spectrophotometric, and chromatographic techniques.

Environmental Engineering Unit Operations I 3 I Prereq C E 341. Unit operations and unit processes of environmental engineering; design of facilities.

Environmental Engineering Unit Operations II 4 (3-3) II Prereq C E 541. Continuation of C E 541.

Environmental Health 2 I Prereq Elem Bact or C E 341. Control of the air, land, and water environment as factors in man's health and well being.

Industrial Hygiene and Air Sanitation 3 (2-3) I Prereq C E 341. Industrial poisons, occupational hazards and diseases, fatigue, ventilation, illumination, and accident prevention; causes and control of atmospheric pollution.

Industrial Wastes and Stream Sanitation 2 II Prereq C E 583, 584, or c/-. Causes of stream pollution; industrial wastes, pollution surveys, waste treatment, and pollution abatement.

Water Quality Management 3 I Principles of systems analysis applied to management of water quality problems including economic, political, and sociological aspects.

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

Environmental Health Engineering Practice 2 S Prereq Bact 101 or C E 341. Mathematical principles applied to environmental health investigation and control.

Radiation Protection 4 (3-3) II Prereq Chem 305; C E 547. Radiation sources and installation, shielding, laboratory design, hazard control; radiation surveys, personnel monitoring, and supervision.

Intermediate Fluid Mechanics 3 I Prereq C E 315. Fluid velocity and acceleration, gravity in fluid motion, one dimensional analysis, viscous effects, fluid turbulence, boundary layer theory, lift, and propulsion.

Advanced Hydraulic Engineering 3 (2-3) II Prereq C E 550. Applications of fluid mechanics to applied hydraulics.


Advanced Hydrology 3 (2-3) II Prereq C E 552. Occurrence and disposal of precipitation, basin characteristics, stream flow with emphasis on hydrographic analysis, frequency analysis, and routing methods.

Hydrodynamics I 3 I Prereq C E 550; Math 273. Equations of continuity, motion, momentum, and velocity from classical hydrodynamics; selected topics in real fluid flow theory.

Hydrodynamics II 3 II Continuation of hydrodynamics, jets and cavities, vortex motions; free surface phenomena including moving pressure fields and waves; hydrofoil theory.


Environmental Health Seminar 1 May be repeated for credit. Lectures and reports on current developments; radiological health.

Environmental Health Engineering Science 3 I Prereq Chem 217 or c/-. C E 341. Chemical principles applied to the unit operations of environmental health engineering.
## Schedule of Studies

At least 49 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

### Freshman Year

**First Semester**
- **Math 107 Precalculus**
- **Chem 105 Principles**
- **Engl 101 Composition**
- **M E 101 Graphic Design**
- **C E 110 Orientation**
- **ROTC or Elective**
- **P E**

**Second Semester**
- **Math 171 Calculus I**
- **Engl Lit Elective**
- **M E 102 Descriptive Geom**
- **Bio S Elective**
- **ROTC or Elective**
- **P E**

### Sophomore Year

**First Semester**
- **Math 172 Calculus II**
- **Phys 201 Engineering**
- **Geol 101 Introductory**
- **C E 221 Transportation Engr**
- **Math 220 Linear Alg**
- **ROTC or Elective**
- **P E**

**Second Semester**
- **Math 273 Calc and Diff Eq**
- **Phys 202 Engineering**
- **Econ 201 Principles**
- **C E 211 Statics**
- **Cpt S 201 Computer Prog**
- **ROTC or Elective**
- **P E**

### Summer Survey Camp

- **C E 201 Prin of Surveying**
- **C E 301 Engineering Surveys**

### Junior Year

**First Semester**
- **C E 212 Dynamics**
- **C E 314 Mech of Materials**
- **C E 341 Envir Health Engr**
- **C E 321 Roadway Design**
- **Phys 303 Mod Physics**
- **M E 320 Materials Lab**

**Second Semester**
- **C E 315 Mech of Fluids**
- **C E 350 Hydrology**
- **C E 330 Mech of Structures**
- **Hum or Soc S Elective**
- **E E 261 E E Science**
- **E E 262 E E Lab**

### Senior Year

**First Semester**
- **C E 433 Reinforced Concrete**
- **C E 352 Hydraulic Engr**
- **C E 317 Soil Mechanics**
- **C E 316 Fluid Mech Lab**
- **C E 463 Administration**
- **C E 497 Seminar**
- **Approved Elective***

**Second Semester**
- **C E 431 Steel Structures**
- **B A 210 Law and Business**
- **M E 301 Thermodynamics**
- **Adv Econ Elective**
- **Approved Elective***

*With careful advanced planning and proper selection ofelectives, the student may obtain considerable extra training in the branch of his interest.

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

### 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 chairman 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.

Students planning to transfer to civil engineering at Washington State University should note that the surveying work is given only at Camp Welch.
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.

The particular but slightly different requirements for students in structural, sanitary, and hydraulic engineering may be determined in consultation with the chairman of the department and the Dean of the Graduate School.

Department of Clothing, Interior Design, and Textiles

Assistant Professor and Chairman of the Department, Mignon Perry; Professor, Jane B. Werden; Associate Professor, Elvira Partida; Assistant Professors, Roberta L. Kilty, Jean Klopfier, Hazel E. Leake, Curtis C. Sherman; Instructors, Kathleen H. Marr, Jean C. Rogers.

The department offers options in interior design, clothing, and textiles. These areas prepare majors for positions in business as well as provide specialized preparation for advanced study.

Clothing
The clothing curriculum provides basic training in textiles, background and experience in creative design, and in understanding the social, psychological, and economic significance of fashion. Students following this curriculum prepare for positions in fashion merchandising when combined with business administration courses. Other areas of specialization are possible when the major is combined with courses in fine arts or communications.

The course of study leads to the degree of Bachelor of Arts in Home Economics.

Description of Courses

C T  For explanation see Index under "Symbols":
107 Design Analysis for the Person and Home 3 Design experience and analysis applied to the home and self.
112 Clothing 3 (1-6) Construction and fitting principles.
212 Flat Pattern Design 3 (1-6) Prereq C T 112; C T 107 or F A 105 recommended. Development of clothing design from a basic pattern.
213 Weaving 3 (1-6) Prereq F A 105.
215 Textiles 3 (2-3)
312 Draping 3 (1-6) I Prereq C T 212; F A 105.
314 Tailoring 3 (1-6) Prereq C T 112. Tailoring techniques in suit and coat making.
318 Social and Economic Developments in Clothing 3 II Prereq Econ 201 or 203; Econ 312 or CFS 352; Psych 101; Soc 101.
410 History of Western Costumes and Fabrics 3 I 1971-72 a/y. Prereq C T 215; 3 hrs Hum or Hist.
412 Original Apparel Design 3 (1-6) II Prereq C T 312. Design and construction of wearing apparel.
417 Social-Psychological Aspects of Clothing 3 I Prereq 12 hrs Soc S. Research and theory.
419 Seminar 1 Prereq senior standing.
499 Special Problems 1-4 May be repeated for credit.

Schedule of Studies

Clothing
At least 22 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>
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<tr>
<td>Eng 101 Composition</td>
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<tr>
<td>C T 107 Design Analysis</td>
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<tr>
<td>C T 112 Clothing</td>
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<tr>
<td>Ph S Elective</td>
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<td>Soc 101 Introduction</td>
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Second Semester

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<tr>
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<td>F A 105 Basic Design</td>
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<td>Psych 101 Prin of Behavior</td>
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Sophomore Year

First Semester

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<tr>
<td>C T 212 Flat Pattern Design</td>
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<td>Econ 102 Fundamentals</td>
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<td>CFS 247 Family Relationships</td>
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Second Semester

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<td>C T 213 Weaving</td>
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<td>Econ 203 Fundamentals</td>
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Junior Year

First Semester

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<tr>
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<tbody>
<tr>
<td>C T 312 Draping</td>
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<tr>
<td>C T 318 Clothing Development</td>
<td>3</td>
</tr>
<tr>
<td>Econ 312 or CFS 352</td>
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<tr>
<td>C T 410 Costumes and Fabrics</td>
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Second Semester

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<tr>
<td>C T 314 Tailoring</td>
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<td>B A 360 Marketing</td>
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<td>CFS 350 Decision Making</td>
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<td>Bio S Elective</td>
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Senior Year

First Semester

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<tr>
<td>C T 411 Socio-Cult Clothing</td>
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<td>B A 470 Retail Merchandising</td>
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Second Semester

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<td>C T 412 Original Apparel Design</td>
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<td>C T 419 Seminar</td>
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<td>C T 415 Adv Textiles</td>
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<td>Engl Comp Elective*</td>
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<tr>
<td>Electives</td>
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</tbody>
</table>

*Engl 201, 301, or 401 may be taken. If student received A or B in Engl 101, no additional Engl Comp is needed.

Students interested in preparation for business positions should elect some of these courses: B A 210, 230, 231, 350, 367, 375, 460, 461, 470, 477.

Suggested fine arts electives: F A 121, 123, 129, 206, 224, 255, 265, 356, 370, 471.

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

Schedule of Studies

Textiles

The textiles curriculum offers opportunity for specialization in science and textile testing and prepares the student for graduate training.

The course of study leads to the degree of Bachelor of Science in Home Economics.

At least 22 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>Engl 101 Composition</td>
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<td>Phys 101 General</td>
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<td>C T 107 Design Analysis</td>
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Second Semester

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<td>FNIM 130 Nutrition</td>
<td>3</td>
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<td>Soc 101 Introduction</td>
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<tr>
<td>C T 112 Clothing</td>
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Sophomore Year

First Semester

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<td>Chem 105 Principles</td>
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<td>C T 212 Flat Pattern</td>
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<td>Psych 101 Prin of Behavior</td>
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<td>CFS 247 Family Relationships</td>
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<td>C T 215 Textiles</td>
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<td>C T 213 Weaving</td>
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First Semester

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<td>C T 312 Draping</td>
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<td>C T 410 Costumes and Fabrics</td>
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Second Semester

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<td>Chem 242 Organic</td>
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<td>C T 318 Soc Econ Development</td>
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<td>CFS 350 Decision Making</td>
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<td>B A 360 Marketing</td>
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<td>chem 217 Quant Analysis</td>
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Second Semester

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Courses printed in Roman type are required or graduation, in italics are optional.

Transfer Students

Transfer students should note the sequence of professional requirements in specialized areas.

Interior Design

This course of study provides a balanced program in the humanities as well as in interior design. The major prepares students for residential and commercial interior design. It also prepares for professional positions as consultants and designers with interior design studios, architectural offices, and retail stores. With supplementary training the graduate can qualify for a position in education as an extension service specialist. The course of study fulfills the national recommendations of the American Institute of Interior Designers. A student chapter is associated with the regional chapter of the National Society of Interior Designers. With advanced study, the program prepares for college teaching.

The department offers courses of study leading to the degrees of Bachelor of Arts in Home Economics, Bachelor of Arts in Interior Design, and Master of Arts in Home Economics (Interior Design).

Description of Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ID</td>
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<tr>
<td>For explanation see Index under &quot;Symbols&quot;</td>
<td></td>
</tr>
</tbody>
</table>

170 Interior Design I 3 (2-3) II Prereq F A 105 or C T 107. Visual elements and principles of design in relation to contemporary living.

270 Interior Design II 3 (1-6) I Prereq I D 170. Interior design problems; understanding fabrication of furnishings; individual furnishing projects.

271 Delineation 2 (0-6) II Prereq Arch 162 or c/. Rendering techniques and media; preparation of professional presentation.

370 Interior Design III 3 (1-6) I Prereq I D 271. Design of contemporary furniture for fabrication.

371 Interior Design IV 3 (1-6) II Prereq junior standing in I D. Design elements and principles of interiors.

372 History of Interiors and Furnishings 3 I Prereq F A 316 or Arch 115. Ancient to 1700.

373 History of Interiors and Furnishings 3 II Prereq I D 372. From 1700 to present.


471 Interior Design VI 4 (1-9) II Prereq I D 470. Professional procedures.

475 Advanced Home Furnishings 3 (2-3) I Prereq C T 107 or F A 105; CFS 247, 350. For nonmajors only. Elements and principles of design as they relate to home furnishings.

477 Display Design 2 (1-3) Prereq C T 107 or F A 140; junior standing. Design principles and elements as they relate to display.

479 Seminar 1 II

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

570 Furnishings and Accessories 3 (2-3) I Prereq I D 470 or 475. Detailed areas of interior design.

572 Advanced Interior Design I 3 (2-3) II 1970-71 a/y.

573 Advanced Interior Design II 3 (2-3) II 1971-72 a/y.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 28 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>
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<tbody>
<tr>
<td>Arch 161 Graphics</td>
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<tr>
<td>F A 105 Basic Design</td>
<td>2</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
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<tr>
<td>F A 121 Drawing</td>
<td>2</td>
</tr>
<tr>
<td>C T 107 Design Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Ph S Elective</td>
<td>4</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Second Semester
Arch 162 Graphics 3
I D 170 Interior Design I 3
F A 255 Water-Color 2
F A 129, 230, or 335 2
Bio S Elective 4
P E 1/2

Sophomore Year
First Semester
I D 271 Delineation 2
I D 372 History of Interiors 3
C T 215 Textiles 3
Psych 101 Prin of Behavior 3
CFS 353 Housing 3
P E 1/2

Second Semester
I D 270 Interior Design II 3
I D 373 History of Interiors 3
Econ or B A Elective 3
Science Elective 4
Arch 220 Building Materials 3
P E 1/2

Junior Year
First Semester
I D 370 Interior Design III 3
Arch 255 Arch Drawing 3
Arch 115 Arch History 3
Elective 6

Second Semester
I D 371 Interior Design IV 3
I A 230 Contemporary Furniture 3
Arch 116 or F A History Elective 3
Elective 3

Senior Year
First Semester
I D 470 Interior Design V 4
F A History Elective 3
Elective 8

Second Semester
I D 471 Interior Design VI 4
Arch 447 Accous and Lighting 3
Elective 8

Transfer Students
Transfer students should note the sequence of professional requirements in specialized areas.

Preparation for Graduate Study
Students entering from other institutions and seeking the Master of Arts degree should have completed laboratory courses in water color, perspective drawing, interior design, and courses in the history of furniture, art, and architecture.

Department of Communications

Associate Professor and Acting Chairman of the Department, H. A. Randell; Associate Professors, W. Calvert, C. O. Cole, J. J. Dunne, B. D. Harrison, M. Hicks, C. A. Watson; Assistant Professors, E. Bannister, T. Heuterman, V. Limburg, R. Manning, H. Stensaas; Instructor, M. McNamee.

The Department of Communications trains students primarily for careers in the mass media and such related fields as advertising and public relations.
Practical experience is coordinated with theoretical training through student participation in student publications and in the broadcasting activities of stations KWSU-AM-TV and KUGR. Both courses and extracurricular experiences provide for the development of knowledge and professional skills in reporting, writing, editing, graphics, performance, programming, production, direction, management, and teaching.

The department offers a course of study leading to the degree of Bachelor of Arts in Communications.

Description of Courses

Com For explanation see Index under "Symbols"

101 [H] Survey of Mass Communications 3
Mass media in contemporary society; the field of persuasion; communication theory and research.

220 Introduction to Journalism 3

225 Reporting 3 Prereq Com 220.

250 Introduction to Broadcasting 3

255 Broadcast Announcing 3 (2-3) Prereq Com 250.

325 Advanced Reporting 3 Prereq Com 225.

327 Photojournalism 3 (2-3) Prereq Com 225 or 365. News photography for reporters and magazine writers.

330 Newspaper Copyreading 3 (1-6) Prereq Com 223.
Newspaper Editing 3 (2-3) I Prereq Com 325, 330. Theory and practice in designing and processing the editorial content of a newspaper.

Broadcast Production 3 (1-6) Prereq Com 250.

Fundamentals of Cinematography 3 (2-3) Prereq Com 350.

Broadcast Copy Writing 3 (2-3) Prereq Com 220 or 250.

Broadcast Newswriting and Editing 3 Prereq Com 220 or 250. Reporting, writing, and editing broadcast news.

Broadcast Advertising and Sales 3 (2-3) I Prereq Com 250.

Newspaper Advertising and Sales 3 (2-3) II Prereq Com 220.

History of Mass Communications 3 II Prereq Com 220 or 250.

Public Information 3 II Prereq Com 225. Media and campaigns for informing the public.

The Law of Mass Communications 3 Prereq junior or senior standing. Basic law of press, radio, and television.

Reporting of Public Affairs 3 Prereq Com 325.

Feature Writing 3 May be repeated for 6 hours credit. I Prereq Com 220.

Editorial Policies and Practices 3 I Prereq Com 325 or 350.

Advanced Broadcast Announcing 3 (1-6) II Prereq Com 255, 350.

Television Workshop 3 (1-6) May be repeated for 9 hours credit. Prereq Com 350.

Broadcast Script Writing 3 (2-3) II Prereq Com 360.

Seminar in Broadcasting 2 II Prereq Com 481; senior standing.

Broadcast Management and Program Planning 2 Prereq Com 250; 6 hrs broadcasting.


Research Methods 3 II Prereq Com 341, 350, or 365.

Special Problems 1-4 May be repeated for credit.

Optional Sequences

1) Journalism: Com 225, 325, 330, 331, 425; one course from Com 327, 365, 427, 460; one course from Com 410, 413, 430, 486.

2) Broadcasting: Com 475, 481; 15 hours from Com 225, 350, 357, 360, 365, 457, 460.

3) Broadcast Journalism: Com 225, 265, 325, 357, 365, 457, 481.

4) Teacher Training: Students preparing to teach should consult the catalog listing of the Department of Education for certification requirements.

Department of Computer Science


Computer science seeks to understand 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 mathematics and engineering. However, it draws upon concepts from a wide variety of other traditional disciplines such as linguistics, psychology, biology, philosophy, and economics. It has applications to these and other disciplines.

The department prepares graduate students for professional careers or research in the field of computing and information processing. In addition, courses are available at the undergraduate and graduate levels to provide a background of knowledge and skills for those students who will require some competence in this area for application in other fields of specialization.
Computer science may be elected as a major or minor field under Option I in General Studies. The department offers a course leading to the degrees of Master of Science in Computer Science and Doctor of Philosophy.

**Description of Courses**

1. **Introduction to Computers 3**
   - Course characteristics which portend major influences on society.

2. **Introduction to Computer Programming 2**
   - Algorithms; flow diagrams; use of a problem-oriented computer language in mathematical and data processing applications.

3. **Processing of Scientific Information 3**
   - Prerequisite: Cpt S 201; Math 202 or 171.
   - Computer programming; logical organization of digital computers; data organization and processing; simulation and mathematical models.

   - Prerequisite: Cpt S 201. Organization of digital computers; concepts and examples in machine and assembly language programming.

5. **Business Data Processing 3**
   - Prerequisite: Cpt S 201. Problems and principles in the automatic handling of large information files utilizing a variety of input-output and storage devices.

6. **Information Structures 3**
   - Prerequisite: Cpt S 310 or 315. Relations among data elements involved in problems, representation of structured data in storage, and techniques for operating on data structures.

7. **Algorithmic Languages and Compilers 3**
   - Prerequisite: Cpt S 310, 315. Formal description of algorithmic languages, syntax, semantics, ambiguities, procedures, and recursion as they pertain to the construction of compilers.

8. **Computer and Programming Systems II**
   - Prerequisite: Cpt S 310, 315. Input and output and storage systems, assemblers, libraries, and control of digital complexes.

9. **Fundamentals of Digital Systems I**
   - Same as E E 414.

10. **Numerical Methods in Matrix Calculus**
    - Prerequisite: Math 446.

11. **Numerical Solutions of Differential Equations**
    - Prerequisite: Math 447.

12. **Special Problems 1-4**
    - May be repeated for credit.

13. **Artificial Intelligence and Heuristic Programming**
    - Formative and descriptive models of intelligent processes; programming languages used to specify these models.

14. **Modeling and Simulation of Biological Systems**

15. **Advanced Digital System Design**
    - Same as E E 514.

16. **Theoretical Foundations of Computer Science I**
    - Boolean algebra; the predicate and propositional calculi; theory of algorithms and computability.

17. **Theoretical Foundations of Computer Science II**
    - Automata theory; graph theory; information theory for discrete sources.

18. **Advanced Topics in Information Processing 3**
    - May be repeated for 6 hours credit.

19. **Formal Languages II**
    - Structure of formal languages; formal languages as tools for the precise specification of procedures; compilers for formal languages.

20. **Information Storage and Retrieval**
    - Prerequisite: Math 360; Cpt S 310. Theory and practice in the storage and retrieval of information; file organization; document and fact retrieval; hardware; system design.

21. **Advanced Numerical Analysis**
    - Same as Math 545.

22. **Computational Linguistics II**
    - Prerequisite: Anth 450. Introduction to computer research in complex systems exemplified by human languages; theory and computer applications by list processing language.

23. **Seminar 1**
    - May be repeated for credit.

24. **Special Problems 1-4**
    - May be repeated for credit.

25. **Research, Thesis, or Examination Variable credit.**

**Schedule of Studies**

The course of study will be adjusted to meet the individual needs and interests of the student; however, all candidates for the master's degree will be expected to complete courses in numerical analysis, programming languages and systems, and probability and statistics. In addition, candidates for the Ph.D. degree will be expected to complete advanced courses in computational theory, digital systems, and formal languages.
Preparation for Graduate Study

As preparation for work toward an advanced degree, a student should have completed an undergraduate major in a field in which he has studied significantly complex physical, biological, or social systems; mathematics at least through elementary calculus; a beginning course in computer programming and some experience in the construction of mathematical and computer models. Students who have not had previous experience with a computer may enter the program provided they remove this deficiency by completing Cpt S 201 and 315.

Conservation

Professors and Directors, B. R. Bertramson and B. R. Ray; Professors, I. O. Bass, G. A. Harris, W. A. Starr; Associate Professors, W. R. Butcher, L. Strait.

The curriculum in conservation is designed to give recognition and emphasis to modern aspects of natural resource conservation. Citizens are particularly aroused to the need for maintenance of a high quality environment for present and future generations. The curriculum provides broad training in the basic sciences, as well as social, economic, and political sciences, with specializations leading to professional employment in one of the natural resource areas.

The curriculum is arranged, advised, and administered jointly by the Colleges of Agriculture and Sciences and Arts. Students will be advised in the academic department which administers their chosen field of specialization. The student, working with the departmental adviser, will develop an individualized program which includes those courses listed in the basic and conservation core plus a group of courses chosen from the selected area of specialization. The objective in the course election process is to give the student sufficient depth in his area of specialization.

The course of study leads to the degree of Bachelor of Science in Conservation.

Schedule of Studies

At least 21 of the total hours required in this program must be in upper-division courses.

Freshman Year

<table>
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<tr>
<th>Semester</th>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>First</td>
<td>Math 107 or 201</td>
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<td>Bio S 103 Intro Biology</td>
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<td>Engl 101 Composition</td>
<td>3</td>
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<tr>
<td></td>
<td>Pol S 101 Am Natl Govt</td>
<td>3</td>
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<td>ROTC or Elective</td>
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<td>P E</td>
<td>1/2</td>
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<tr>
<td>Second</td>
<td>Math 171 or 202</td>
<td>4-3</td>
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<tr>
<td></td>
<td>Bio S 104 Intro Biology</td>
<td>4</td>
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<td></td>
<td>Spe 112 Fundamentals</td>
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<tr>
<td></td>
<td>Hum 101 Integrated</td>
<td>3</td>
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<td>ROTC or Elective</td>
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Sophomore Year

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<tr>
<td>First</td>
<td>Chem 105 Principles</td>
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<tr>
<td></td>
<td>Econ 201 Principles</td>
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<tr>
<td></td>
<td>Geol 101 Introductory</td>
<td>4</td>
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<tr>
<td></td>
<td>For 301 Environments</td>
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<tr>
<td>Second</td>
<td>Chem 106 Principles</td>
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<td>Engl 201 Inter Comp</td>
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<td>Soils 201 Soils</td>
<td>3</td>
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<tr>
<td></td>
<td>Bot 232 Intro Syst Bot</td>
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Junior Year

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<th>Hours</th>
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<tr>
<td>First</td>
<td>Zool 330 Prin of Cons</td>
<td>3</td>
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<tr>
<td></td>
<td>Biom 310 or 412</td>
<td>3</td>
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<td></td>
<td>For 351 Range Mgmt</td>
<td>3</td>
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<td>Elective*</td>
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<tr>
<td>Second</td>
<td>C E 350 Hydrology</td>
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<td></td>
<td>Soils 301 Soil Mgmt</td>
<td>3</td>
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<td></td>
<td>Bot 462 Synecology</td>
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Senior Year

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<tr>
<td>First</td>
<td>Ag Ec 480 Resource Econ</td>
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<td>Pol S 443 Admin Law</td>
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<td></td>
<td>For 460 Watershed Mgmt</td>
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<tr>
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<td>Elective*</td>
<td>6</td>
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<tr>
<td>Second</td>
<td>Soils 416 Air Photo Interp</td>
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<tr>
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<td>For 493 Land Use Seminar</td>
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<td>Elective</td>
<td>5-6</td>
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</tbody>
</table>
* To be selected from area of specialization. Courses printed in Roman type are required or graduation, in italics are optional.

**Departmental Requirements**

Basic Core: 59-61 hours.
- Bot 310 or 412; Bio S 103, 104; Bot 232; Chem 105, 106; Econ 102 or 201; Engl 101, 201; Soils 201; For 301; Geol 101; Hum 101; Math 107, 171 or 201, 202; Pol S 101; SPS 112.

Conservation Core: 30 hours.
- Ag E 480; Bot 462; C E 350; For 351, 460, 493; Soils 301, 416; Pol S 443; Zool 330.

Area of Specialization: 20 hours from one of the following plus 10 hours electives:

1. **Economics and Administration**: Econ 102, 201, 203, 301, 340, 401; Ag E 101, 201, 301, 370, 480, 490; Pol S 101, 440, 443, 446, 450; Soc 101, 270, 330; Geog 102, 345.

2. **Forestry**: For 201, 230, 331 or 348, 302, 311, 399, 411, 415.

3. **Range Management**: Bot 320, 436; For 352, 354, 399, 451, 452.

4. **Soils and Crop Science**: Soils 301, 404 or 408, 411; Agron 202, 203, 301, 305, 411.

5. **Wildlife Conservation (Biology)**: Zool 220, 222, 232, 323, 428, 431, 435, 436, 438, 440, 512, 530. When possible, students should be encouraged to include Zool 232, 435, and 436 in their programs, but as these courses are offered on an alternate year basis they will not fit easily into some programs. The list of courses has been extended to take care of this problem as well as giving consideration for students who transfer and lack prerequisites for some of the advanced work.

**Department of Economics**

**Professor and Chairman of the Department**

The curriculum in economics is designed for those students who prefer a general university program with emphasis on the study of economic relationships; who are interested in work leading to employment in the many national and international economic organizations, public and private; who wish to prepare for high school or college teaching; or who wish the broad economic background training for industry or agriculture. The course of study contains sufficient flexibility to permit the electing of advanced military and other courses while meeting all departmental and General University Requirements.

The department offers courses of study leading to the degrees of Bachelor of Arts in Economics, Bachelor of Arts in Geography, Master of Arts in Economics, and Doctor of Philosophy.

**Description of Courses**

**Econ** For explanation see Index under "Symbols"

102 [S] Fundamentals of Economics 3 Not open to first-semester freshmen. Credit not granted for both Econ 102 and 201. The first half of the intensive general introductory course.

198 [S] Economics Honors 3

201 [S] Principles of Economics 4 Prereq sophomores standing. Credit not granted for both Econ 201 and 102. The general introductory course.


301 Theory of the Firm and Market Policy 3 Prereq Econ 201 or 203. Price determination and market behavior under different market structures and the problems posed for public policy.

312 Economics of Consumption 3 I Prereq Econ 201 or 203. Consumption expenditures and problems; theory of consumer choice; public policy and consumer welfare.

320 Money and Banking 3 Prereq Econ 201 or 203. Principles of money, credit, banking, and national income analysis.

340 Public Finance and Taxation 3 Prereq Econ 201 or 203. Theory and practice at local, state, and federal levels.

350 Labor Economics and Problems 3 Prereq Econ 201 or 203. Theory and practice in the field of labor economics.

364 Transportation Economics 3 Prereq Econ 102 or 201. Characteristics of transportation systems; market structure; case for and progress of public control of transport agencies.
401 Intermediate Macroeconomic Analysis 3 Prereq Econ 320. Measurement and significance of the national income accounts; introduction to income, employment, and growth theory with policy implications.

402 History of Economic Thought 3 II Prereq Econ 301. Development of economic thought; classical and neoclassical schools, forerunners, and critics considered in relation to their historical setting.

410 Elements of Mathematical Economics 3 II 1970-71 a/y. Prereq Econ 301; Math 202. A systematic treatment of neoclassical economics and related subjects using the calculus as the primary analytical tool.

431 Economic History of the United States 3 I Prereq Econ 201 or 203. The development of the economy of the United States.

445 Economic and Business Fluctuations 3 II Prereq B A 315; Econ 320. Business cycles and other economic fluctuations, theory, and experience.

450 Collective Bargaining 3 I Prereq Econ 350. Legal status, current attitudes, and specific collective bargaining agreements with some emphasis given to Pacific Northwest industries.


460 Industrial Organization and Public Policy 3 I Prereq Econ 301. Relations of market structure, economic efficiency, and public policy; purposes and effectiveness of antitrust laws and other legislation regulating business practices.

463 Current Transportation Problems 3 II Prereq Econ 364. Descriptive and analytical treatment of domestic and international transportation problems; emphasis on those of the Pacific Northwest.

464 Land Transportation Agencies 3 II Prereq Econ 364. Economic organization, costs, pricing, and policies of various land carriers, including highway, pipeline, and railway carriers.

465 Air and Water Transport 3 II Prereq Econ 364. The economic organization, costs, pricing, and policies of air and water carriers.

468 Public Utility Economics 3 I 1970-71 a/y. Prereq Econ 201 or 203. Economic 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 I Prereq Econ 320. Analysis and description of international specialization; capital movements; exchange rate systems; balance of payments adjustments; international finance policy.

472 Economic Development 3 I Prereq Econ 201 or 203. Problems of the economically underdeveloped nations.

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

501 Systematic Micro-Economics 3 Prereq Econ 301. Individualism and welfare; the firm as organization; theory of market economy; optimization in time; economic decision theory; innovation and progress.

502 Macro-Economic Analysis 3 Prereq Math 201. Functional distribution theory; aggregation and the national accounts; macro-economic equilibrium; the price level problem; economic growth and fluctuations.

503 Seminar in Economics Theory 3 I Prereq Econ 501 or 502; Math 202. Contemporary developments in micro- and macro-economic theory and policy; effects of institutional changes.

504 History of Economic Thought 3 I Evolution of economic theory and thought in historical context; classical and neoclassical contributors, precursors, and critics.


511 Econometrics 3 II 1971-72 a/y. Prereq Econ 510. Use of mathematical, economic, and statistical research as a means of testing economic theorems.

512 Econometrics: Substantive Findings 3 I 1970-71 a/y. Prereq Econ 511. Contributions to a positive science of economics based on econometric research.

520 Monetary Theory and Policy 3 I 1970-71 a/y. Economics of money and finance; theory and practice of central banking; structure and regulation of finance industry.

521 Seminar in Monetary Economics 3 I 1971-72 a/y. Prereq Econ 520. Contemporary developments in financial
institutions and in theoretical monetary economics.

530 Economic History 3 II Prereq Econ 201 or 203. Changes in the European economy.

540 Advanced Public Finance 3 II Prereq Econ 340. Philosophies of taxation; economic effects of specific taxes; state and local financial problems; education, highways, and state and city government.

541 Seminar in Fiscal Policy 3 II 1971-72 a/y. Prereq Econ 340. Recent developments in federal policy; impact of public expenditures and taxes upon the economy; growth and underdeveloped countries.

545 Business Cycle Theory 3 I Examination of literature.

552 Labor Theory 3 II Developments in labor theory: wage theory and recent journal literature.

560 Seminar in Industrial Organization 3 II Prereq Econ 460. Industrial organization, market conduct, and performance; appraisal of antitrust legislation.

564 Transportation Theory and Policy 3 I


570 International Economics 3 II 1970-71 a/y. The basic nonmonetary theory; commercial policy; effects of economic integration.

571 Monetary Aspects of International Economics 3 II 1971-72 a/y. Balance-of-payments accounting; methods of adjustment to payments imbalances; the foreign exchange market; international financial institutions.

572 Theoretical and Institutional Aspects of Economic Development 3 II Selected topics in developmental economics.

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

600 Research, Thesis, or Examination Variable credit.

**Schedule of Studies**

At least 31 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Before the junior year a student should have completed at least three-fourths of the General University Requirements. Students who have not had two years of one foreign language in high school must take one year of one foreign language in college.

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Hist 101 or 120</td>
<td>3</td>
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<tr>
<td>Hum Elective</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 102 Fundamentals</td>
<td>3</td>
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<tr>
<td>Pol S 101 Am Natl Govt</td>
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<tr>
<td>Geog 105 Fundamentals</td>
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<tr>
<td>Math 107 or 201</td>
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<tr>
<td>Elective</td>
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<td>ROTC or Elective</td>
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**Sophomore Year**

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<tr>
<td>Anth 101 or Psych 101</td>
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<td>Hum Elective</td>
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<tr>
<td>Lab Science Elective</td>
<td>3-4</td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>B A 230 Prin of Acctg</td>
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<tr>
<td>Econ 203 Fundamentals</td>
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<tr>
<td>Lab Science Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>Math 202 Math Analysis</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
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**Junior Year**

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<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 320 Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>B A 315 Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Econ 301 Theory of the Firm</td>
<td>3</td>
</tr>
<tr>
<td>Science Elective</td>
<td>3-4</td>
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<tr>
<td>Elective</td>
<td>2</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 350 Labor Econ and Prob</td>
<td>3</td>
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<tr>
<td>B A Elective¹</td>
<td>6</td>
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<tr>
<td>Econ Elective²</td>
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<tr>
<td>Elective</td>
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**Senior Year**

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<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>Econ 401 Macro-Economics</td>
<td>3</td>
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<tr>
<td>Econ Elective²</td>
<td>3</td>
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<tr>
<td>Elective</td>
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<tr>
<th>Second Semester</th>
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<tr>
<td>Econ Elective²</td>
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<tr>
<td>Elective</td>
<td>10</td>
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</tbody>
</table>

¹Electives must include two from B A 231, 325, 340, 360.
²Electives must include Econ 402 or 431;
two from Econ 340, 364, 445, 460, 468, 470.

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

**Fields of Study**

After the first two years students will apply their knowledge of basic economic principles to more specialized areas: 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**

A student planning to transfer into economics by the end of his sophomore year should have completed the equivalent of the above freshman and sophomore courses if he plans 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 provided in the undergraduate program shown above. However, students with supporting work in related areas may enter into graduate study with somewhat less formal undergraduate training than is provided in the curriculum above. 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 him plan a program that best fits his abilities and objectives.

The department offers courses of study leading to the degrees of Bachelor of Arts in Education, Bachelor of Arts in Industrial Arts, Bachelor of Science in Agricultural Education, Master of Science in Vocational Technical Education, Master of Education, Master of Arts in Education, Doctor of Education, and Doctor of Philosophy.

**Admission**

1. A student may make application for admission to the Department of Education after he has earned at least 30 hours of credit. He must be accepted as an (elementary) education major or as a double major in education before he may take any courses above Educ 201. Application forms must be secured from the department.

2. An over-all C average, a C average in all education courses, and a C average in the teaching major or the combined teaching major and minor are required for admission to and continued enrollment in the department.

3. Students seeking admission to the teacher-education program should have completed during their freshman year the majority of the General University Requirements for Graduation. Students may consult with an adviser from the department during their freshman year.

4. Applicants for the Provisional Certificate who have a bachelor's degree from an accredited institution other than Washington State University must complete the teacher-education program and earn not less than 32 semester hours in residence. They shall apply for admission to the university to work toward a teaching certificate.

5. Applicants who have had one or more years of experience as teachers and who wish to work for a standard teaching certificate shall apply for admission to the Admissions Office as a Class 3 or to the Graduate School as a Class 0. Those who wish to prepare for supervisory or administrative positions in the schools shall apply for admission to the Graduate School to pursue the particular program.
Preparation for Teaching Certificates

Provisional Certificate—A Four-Year Program

Under the authority of the laws of the state of Washington and the regulations of the State Board of Education, Washington State University grants a Provisional Certificate to all candidates who meet the United States citizenship requirements of Washington certification, who have the personal qualifications to teach, and who meet the specified requirements. The certificate is valid for three years, the first year of which will be limited by the university as to grade level and subject matter, and may be renewed for a period of three years thereafter to teach in the public schools of the state.

Students in agricultural education are referred to Agricultural Education for their certification requirements, which vary somewhat from the program described later in this section.

Standard Certificate and the Fifth Year of Preparation

Experienced teachers may be recommended by Washington State University to the State Department of Public Instruction for the Standard Certificate. Candidates for the certificate shall meet specific requirements dependent upon their present certification status. Teachers who are interested in securing this certificate and who hold other than the Provisional Certificate may contact the Department of Education. The Standard Certificate is valid as long as the individual remains in the teaching profession and for a period of five years thereafter.

Holders of the Provisional Certificate may be recommended for a Standard Certificate upon completion of two years of successful teaching experience and an approved fifth-year college program of studies (30 semester hours). A maximum of 10 semester hours of preteaching credit will be permitted on a fifth-year program at Washington State University. Additional preteaching credits may be approved in certain cases if they are a part of a planned fifth-year program. The fifth year of study, which should be planned with the recommending institution, provides an opportunity for specialization and to strengthen teaching competence. General regulations for the fifth year of study, which may be completed in summer sessions or in an academic year, may be secured from the Department of Education.

Certification of Specialized Personnel

The State Board of Education has established standards of preparation and certification for school psychologists, school social workers, and school nurses. Washington State University does not offer programs of study leading to these certificates but the requirements may be secured upon request from the chairman of the department or the State Department of Public Instruction, Olympia, Washington.

Preparation for Administrators and Other Specialists

The Department of Education in cooperation with other departments offers graduate training in the fields of administration and supervision, curriculum and teaching, guidance and personnel, elementary education, junior college and higher education, and measurement and evaluation.

The Department of Education is authorized by the State Board of Education to prepare candidates for principals' 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 credentials should be made after at least one year of teaching experience to the State Department of Public Instruction prior to or immediately upon entering a program of preparation. Applicants must meet the same Graduate School admission requirements as graduate degree candidates.

Industrial Arts

The Department of Education includes the field of industrial arts, which provides programs for both the teaching of industrial arts in the public schools and collegiate institutions and a technical program such as might be used in industrial or commercial activities. Course work includes woodworking, drawing and design, metals, electronics, crafts, the professional areas of curriculum and instruction, and measurement and evaluation, as well as graduate work in the field of vocational technical education. Course offerings are listed in a separate section of the catalog.

Transfer Students

Education majors are required to complete in residence at least one-half of the total hours required in professional education for the Provisional Certificate.
Course of Study

The State Board of Education has established guidelines and standards for teacher-preparation programs. All Provisional Certificates recommended by the Department of Education of Washington State University meet these standards.

The Provisional Certificate is limited as to grade level and subject-matter preparation for the first year of teaching. Each student will prepare to teach at one of three levels: elementary school, junior high school, or senior high school, and plan his program in accordance with the requirements of his 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. These additional requirements may include an acceptable minor for the second level of teaching, appropriate methods courses, and a directed teaching assignment on more than one level.

The following professional laboratory experiences are provided:

1. A "September Experience" is required. The student participates in the school activities during the first two weeks of the public school term in the September following completion of Educ 101. Arrangements are made for this experience with the Department of Education.

2. In Educ 201 and 301 or 304, all students participate in required directed observations in public school classrooms one-half day per week.

3. Educ 405 or 406, Directed Teaching, consists of approximately nine weeks of full-time participation in the teaching program of a public school. The directed teaching semester consists of especially planned half-semester courses. It is not possible to enroll in regular full-semester courses during that time.

Requirements for the Provisional Certificate

Elementary School Preparation

1. General Education and General University Requirements for Graduation: 45 hours
   - 3 hours English composition; 21 hours of humanities and social sciences, of which at least 6 hours must be in each field (include Psych 101); Hist 455 or Pol S 206 used to fulfill the Washington state history and government requirement for the teach-

2. Professional Education and Professionalized Subject-Matter Minor: 41 hours

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<tr>
<th>Hours</th>
<th>Course</th>
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<tbody>
<tr>
<td>2</td>
<td>Educ 101 Intro to Amer Educ</td>
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<tr>
<td>4</td>
<td>Educ 201 Human Devel</td>
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<tr>
<td>3</td>
<td>*Educ 390 Elem School Art</td>
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<td>6</td>
<td>Educ 304 Elem Educ I</td>
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<td>5</td>
<td>*Educ 305 Elem Educ II</td>
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<td>3</td>
<td>Educ 401 Eval of Learning</td>
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<td>3</td>
<td>Educ 403 or 404 Social Foundations</td>
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<td>8</td>
<td>Educ 405 or 406 Dir Teaching</td>
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<td>2</td>
<td>*H Ed 480 or 481 School Health</td>
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<td>3</td>
<td>*Mus 390 Materials and Methods</td>
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<tr>
<td>2</td>
<td>*PEP 380 Elem School</td>
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<tr>
<td>0</td>
<td>September Experience</td>
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</table>

* Required professionalized subject-matter minor courses.

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 outlined above. They will certify their majors in education as soon as possible after earning 30 hours of credit but before they enroll in courses above Educ 201; they will then be assigned advisers in the Department of Education.

Junior High School Preparation

1. General Education: approximately 45 semester hours including H Ed 480 or 481 (380 or 381); Psych 101; and courses used to meet the General University Requirements for Graduation for the bachelor's degree (see item 4 below). Students may be required to take additional course work in English if they do not meet acceptable standards of competency.
2. Professional Education: 26 semester hours

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<th>Course</th>
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<td>Educ 101 Intro to Amer Educ</td>
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<tr>
<td>Educ 201 Human Devel</td>
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<tr>
<td>Educ 301 Teach Sec Schools</td>
<td>4</td>
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<tr>
<td>Educ 401 Eval of Learning</td>
<td>3</td>
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<tr>
<td>Educ 403 or 404 Social Foundations</td>
<td>3</td>
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<tr>
<td>Educ 405 or 406 Dir Teaching</td>
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<tr>
<td>Educ 450 or 451 Sec School Reading</td>
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<tr>
<td>September Experience</td>
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3. Subject-Matter Preparation: approximately 45 semester hours

The student will select a teaching major of approximately 30 semester hours and a teaching minor of approximately 15 semester hours from the junior high school majors and minors listed in this section of the catalog. The major 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 (mathematics 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 arts, 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, meet the General University Requirements for Graduation and the departmental requirements, and meet the certification requirements outlined above. They will certify as a double major in both the degree department and the Department of Education. They must be certified education majors before they take courses above Educ 201. They will have advisers in both departments.

High School Preparation

1. General Education: approximately 45 semester hours including H Ed 480 or 481 (380 or 381); Psych 101; and courses used to meet the General University Requirements for Graduation for the bachelor's degree (see item 4 below). Students may be required to take additional course work in English if they do not meet acceptable standards of competency.

2. Professional Education: 24 semester hours

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<th>Course</th>
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<td>Educ 201 Human Devel</td>
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<tr>
<td>Educ 405 or 406 Dir Teaching</td>
<td>8</td>
</tr>
<tr>
<td>September Experience</td>
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3. Subject-Matter Preparation: approximately 45 semester hours

The student will select a teaching major of approximately 30 semester hours and a teaching minor of approximately 15 semester hours from the 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, meet the General University Requirements for Graduation and the departmental requirements as listed under the department concerned, and meet the certification requirements outlined above. They will certify as a double major in both the degree department and the Department of Education. They must be certified education majors before they take courses above Educ 201. They will have advisers in both departments.

Description of Courses

Courses numbered above 201 are for certified Elementary or Secondary Education majors only.

Educ For explanation see Index under "Symbols"

College Reading Clinic No credit. A service offered to any student whose reading skills are inadequate.

101 Introduction to American Education 2
Not open to first-semester freshmen.

201 Human Development and Education 4
(3-3) Prereq Educ 101 or c/; Psych 101. Theory and principles of learning and development as applied to the classroom: emotional, intellectual, physical, social; public school observations included.

301 Teaching in Secondary Schools 4 (3-3)
Prereq Educ 201. Materials and general methods for teachers; observation
to be scheduled in a 3-hour block once a week.

04 Elementary Education I 6 (5-3) Prerequisite Educ 201. Methods and materials for teachers of reading, language arts, and children's literature; includes observations in the public schools.

05 Elementary Education I 5 Prerequisite Educ 201, Math 105 or c/. May be taken before Educ 304. Methods and materials for teachers of science, arithmetic, and social studies.

10 Reading Materials for Adolescents 3 Prerequisite Educ 301 or 304 or c/. Selection, evaluation, and use of reading materials for adolescents.

40 Methods of Teaching Agriculture 2 I For juniors and seniors.

41 Teaching Materials for Vocational Agriculture 2 II Selection and organization.

43 Methods of Teaching Home Economics 2 or 3 Prerequisite Educ 301 or c/; 18 hrs H E.

90 (250) Elementary School Art Education 3 (2-3) Prerequisite Educ 201. Development and use of arts and crafts materials and activities.

01 Evaluation of Learning 3 (2-3) Prerequisite Educ 301, 304, or 305. Theory and methods of evaluating pupil progress.

02 Evaluation of Learning 3 (2-3) Same as Educ 401.

03 Social Foundations of Curriculum 3 Prerequisite Educ 301 or 304; c/ in directed teaching. Public school curriculum.

04 Social Foundations of Curriculum 3 Same as Educ 403.

05 Directed Teaching 8 (0-24) Prerequisite Educ 301 or 304; senior standing; C average in departmental requirements; cumulative C average. Supervised teaching in public schools (full day for one half of a semester), includes a 2-hour weekly seminar in problems of teaching.

06 Directed Teaching 8 Same as Educ 405.

07 Directed Teaching 8 Same as Educ 405. For Ag Ed majors.

10 Ethnic Groups and Public Education 2 or 3 Prerequisite junior standing. Resources concerning ethnic groups in public education; relating curriculum and teaching to cultural backgrounds; current issues.

43 Home Economics Education 2 Prerequisite Educ 343; c/ in 405 or 406; teaching experience for summer session. Organization and administration of courses.

445 Audio-Visual Aids in Education 2 (1-3) or 3 (2-3) Prerequisite 8 hrs Educ. Sources and evaluation of materials; practice in techniques with materials and equipment.

446 Audio-Visual Aids in Education 2 or 3 Same as Educ 445.

447 Preparation and Production of Audio-Visual Aids 2 (1-3) or 3 (2-3) Prerequisite Educ 403 or 404. Planning and preparing lantern slides, charts, graphs, diagrams, specimens, models, classroom recordings, and camera use.

450 Reading in the Secondary School 2 or 3 Prerequisite Educ 301 or c/. Development of reading and study skills; demands of various content areas and implementation of secondary reading programs.

451 Reading in the Secondary School 2 or 3 Same as Educ 450.

453 Innovations in Reading 2 I Prerequisite Educ 304, 450, or 451. Aspects of teaching reading beyond basic methods course; individual diagnosis, current programs, and trends; activities and materials for enrichment.

454 Innovations in Reading 2 Same as Educ 493.

457 Early Childhood Language Arts 3 (2-3) Relationship of cultural and developmental factors in language and reading abilities at pre-school and primary levels; practice individual instruction.

458 Introduction to Guidance 2 or 3 Same as Educ 459.

459 Introduction to Guidance 2 or 3 Prerequisite 12 hrs Educ. Guidance: history, philosophy, and services.

460 Elementary School Guidance 2 or 3 Prerequisite 12 hrs in Educ. Special nature of counseling theory, interpersonal relationships, and guidance services in the elementary school.

461 Theory of Occupational Choice 2 Prerequisite Educ 459. Use, evaluation, and trends of occupational information.

465 Educational Statistics 3 Prerequisite Educ 401 or 402. Descriptive statistics, including measures of central tendency, variability, and techniques of correlation.

466 Educational Measurements 2 or 3 Prerequisite Educ 465. Theory and use of standardized educational measurement devices; intelligence, aptitude, and achievement tests.

468 Education of the Gifted Child 2 or 3 Prerequisite 9 hrs Educ. Educational provisions for the gifted child.
492 Supervision of Public School Arts and Crafts 3 (2-3) Prereq Educ 390. Methods of developing and supervising programs.

495 Current Issues in Education 1-4 May be repeated for 8 hours credit. Specific topics of current importance to professional education.

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

501 Philosophy of Education 3 Development of American educational philosophy.

502 Advanced Educational Psychology 3 Prereq Educ 401 or 402. The interpretation of fundamental psychological facts, theories, and principles applying to education.

504 Comparative Education 3 II Comparison of ways contemporary societies meet their educational problems; England, USSR, and Western Europe.

505 Development of Education in the United States 3 II Formal education in the United States is traced as it was influenced by changing intellectual, social, and political conditions.

507 Foundations of Education 3 Educational adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Prereq teaching experience. Recent research on teaching procedures and media; implications for modifying school programs.

511 Seminar in Elementary School Education 2 or 3 May be repeated for 6 hours credit. Prereq teaching experience. Curriculum problems involving the modern elementary school.


513 Junior High School Organization and Curriculum 3 Prereq Educ 403 or 404. Curriculum patterns and organization of the modern junior high school.

514 Basic Principles of Curriculum Design 3 I Prereq Educ 511 or 512. Principles applied in specific content areas.

515 Curriculum Development 2 or 3 1970-71 a/y. Prereq Educ 403 or 404. Techniques of organizing staff efforts to improve school programs at both the elementary and secondary levels.

516 Supervision 2 or 3 Prereq Educ 403 or 404; 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 Educ 445 or 446. Relates research and theory of communication to instructional resources and current educational technology; problems of planning and administering program.

520 Seminar in Curriculum and Instruction 3-6 Prereq Educ 511 or 512; teaching experience. Sociological, economic, and value-judgment issues underlying development; determination of specific content area; patterns; evaluation of programs.

540 Elementary School Social Studies 3 II Prereq Educ 305; teaching experience. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Elementary School Science 3 I Prereq Educ 305; teaching experience. Theories and research underlying modern science programs with classroom implications.

542 Elementary School Mathematics 3 II Prereq Educ 305; Math 105; teaching experience. Classroom experiences and materials for helping children understand number properties and operations; research findings related to instruction.

543 Elementary School Language Arts 3 II Prereq Educ 304; teaching experience. Trends, issues, and research in oral and written communications.

544 Children's Literature 3 II Prereq Educ 304; teaching experience. Trends, issues, and research in children's literature.

550 Research in Reading 2 or 3 Prereq Educ 304; teaching experience. Research applied to pertinent classroom problems in the teaching of reading.

552 College Reading Practicum 1 (0-3) to 3 (0-9) Prereq Educ 304, 450, or 451; teaching experience. Clinical practice; reading teaching skills to college students; programs, materials, techniques, and readings; applicable secondary and college reading programs.

553 Remedial Reading 4 (3-3) Prereq Educ 304. Remedial techniques for experi-
enced teachers, remedial reading teachers, and reading consultants; causes of disability, testing, diagnosis, and remediation; tutoring.

558 Individual Appraisal 3 I Prereq Educ 466. Case study procedures in guidance; collecting, synthesizing, and interpreting test and non-test data.

559 (463) Theoretical Foundations of Counseling 3 I Prereq Educ 459; Psych 201, 431. For beginning counselors.

560 Student Personnel Services in Higher Education 2 or 3 Prereq Educ 459. Philosophy, structure, functions, and organization of student personnel services.

561 Group Counseling 3 Prereq Educ 559, 562; 3 hr guidance course. Nature, philosophy, and theory of group counseling; group process; leadership and evaluation of group behavior.

562 Practicum in School Counseling 3 (0-9) May be repeated for 6 hours credit. Prereq Educ 559 or Psych 520; 9 hrs guidance. Supervised practice in school counseling.

563 Seminar in Counseling and Student Personnel 2 or 3 May be repeated for 6 hours credit. Prereq 9 hrs guidance. Review of guidance, counseling, and student personnel research; newer developments.

564 Organization and Administration of Guidance Services 2 or 3 Prereq 9 hrs guidance. Philosophy and problems in coordination.

565 Advanced Statistics in Psychology and Education 3 Same as Psych 567.

566 Evaluation Techniques 3 Prereq Educ 466. Theory of scaling; development of techniques for appraising attitudes, interests, and appreciation.

567 Test Construction 3 Prereq Educ 466. Test items construction; item analysis; development of norms.

568 Methods of Research and Thesis Writing 3 Research methods and design; collection, analysis, and interpretation of data.

569 Seminar in Quantitative Techniques in Education 2 or 3 II May be repeated for 6 hours credit. Prereq Educ 565. Analysis of variance and covariance and nonparametric statistics.

570 Junior College Education 3 For teachers and administrators. Development and function of the junior community college.

571 Lower-Division and Junior College Instructional Problems 3

572 The American College and University 2 or 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Recent Developments in Higher Education 3

574 Seminar in Higher Education 2 May be repeated for 6 hours credit. Prereq two courses in higher education. Advanced treatment of varied topics drawn from the entire level of higher education.

575 The College Student and His Culture 2 or 3 Characteristics, subculture, development, and impact of the college experience.

580 School Administration 2 or 3 Prereq teaching experience. For superintendents or prospective superintendents. Principles and practices.

581 Elementary School Organization and Administration 2 or 3 1970-71 a/y. Required for elementary principal's credential.

582 Secondary School Administration 3 Prereq Educ 403 or 404. For superintendents and secondary principals. Required for principal's credential.

583 Public Relations in Education 2 or 3 Methods of obtaining understanding of purposes and problems of public education.

584 Personnel Relationships in Public Schools 2 or 3 Prereq Educ 580. Human relations in education; problems involved and practical solutions considered.

585 School Finance 3 Prereq Educ 580.

586 School Plant Planning 2 or 3 Prereq Educ 585. To meet the needs of superintendents and principals interested in school building programs.

587 Seminar in School Administration 3-6 Prereq 6 hrs graduate work in administration. Interdisciplinary seminars; related studies; discussions in the several areas by specialists.

588 The Law and Education 3 I 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.

590 Internship 3 May be repeated for 12 hours credit. Prereq permission of department chairman. Internship in professional positions.
Learning Resources

Lib S
201 Library Services and Resources 3 Prereq Educ 201. Orientation to philosophy and services of learning resources center; basic resources and reference materials including non-book materials.

202 Selection of Book and Non-Book Materials 3 Prereq Educ 201. Basic principles, criteria for selection, evaluation, and current issues in selection.


401 Organization and Administration of Learning Resources Programs 3 Prereq 9 hrs Lib S. Professional standards for good library and media programs; traffic patterns, physical facilities, displays, and publicity; responsibilities of professionals and para-professionals.

402 Advanced Cataloging and Classification 2 Prereq Lib S 301, 401. Problems in cataloging and classification of books and non-book materials found in public schools, including basic understanding of Library of Congress classifications.

403 Data Processing and the Library 3 Prereq Lib S 402. Theoretical and practical application of data processing equipment and techniques in performing library functions.

501 Reference in Humanities and Social Science 2 Prereq Lib S 201. Resources in humanities and social science.

502 Reference in Science 2 Prereq Lib S 201. Resources in science.

Vocational Technical Education

VTE

440 Foundations of Vocational Technical Education 2 or 3 Prereq 9 hrs Educ. Local, state, and national vocational technical educational legislation, policies, programs, and organizations.

460 Occupational Experience Programs 2 I 1970-71 a/y. Prereq VTE 440. Organization and supervision of programs designed to provide work experience for high school and community college students.

470 In-Service Personnel Development II 1971-72 a/y. Objectives, principles, and processes of in-service training for vocational technical educational personnel.


520 Problems and Trends in Vocational Technical Education 1-4 May be repeated for 8 hours credit. Prereq VTE 440. Current technological developments; socio-economic and educational problems; exemplary programs; new legislation.

522 Instructional Systems 3 I 1970-71 a/y. Principles and processes of educational systems; development.

524 Vocational Guidance and Counseling 2 or 3 I 1970-71 a/y. Prereq Educ 458 or 459. Vocational guidance needs and objectives; principles and practices; organization and utilization of occupational information.

540 Vocational Technical Education in Adult Education 2 or 3 II 1971-72 a/y. Prereq VTE 440. Principles of adult education; legal basis, policy making, staff and student personnel; instructional programs, public relations, physical plant, and management.

543 Administration and Supervision of Vocational Technical Education 3 II 1970-71 a/y. Prereq VTE 440; Educ 501. Principles and practices of planning, budgeting administration, and supervision of vocational technical education in schools, colleges, and industry.

545 Planning Vocational Technical Education Facilities 2 or 3 I 1970-71 a/y. Prereq VTE 440. Principles and processes of facility planning; equipment selection and placement; selection, care, and arrangement of supplies.

570 Internship in Vocational Technical Education 3 May be repeated for 12 hours credit. Structured and directed experiences in teaching, supervisory, and administrative positions in schools, colleges, industrial firms, and state offices.

583 Seminar in Vocational Technical Education 2 May be repeated for credit. Prereq 6 hrs VTE.
Special Problems 1-4 May be repeated for credit.
Research, Thesis, or Examination Variable credit.

Special Methods
Special methods courses dealing with the techniques of teaching the different secondary school subjects are listed under the departments concerned.

Schedule of Studies

Junior and Senior High School Majors
Students planning to follow this schedule should have completed their General University Requirements during the freshman and sophomore years, including Psych 101. They should follow, as undergraduates, the schedule of studies of their degree department and the schedule printed below.

Freshman and Sophomore Years

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Educ 101 Intro to Amer Educ</td>
<td>2</td>
</tr>
<tr>
<td>Educ 201 Human Development</td>
<td>4</td>
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</table>

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ 301 Teach in Sec Schools</td>
<td>4</td>
</tr>
<tr>
<td>Special Methods, if required</td>
<td>2</td>
</tr>
</tbody>
</table>

Considerable progress should have been made on the teaching major and minor requirements. With special approval of the student's adviser in the Department of Education, directed teaching may be taken during the second semester of the junior year.

Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Educ 401</td>
<td>3</td>
</tr>
<tr>
<td>The Directed Teaching Semester</td>
<td></td>
</tr>
<tr>
<td>Educ 405 or 406</td>
<td>8</td>
</tr>
<tr>
<td>Educ 403 or 404</td>
<td>3</td>
</tr>
<tr>
<td>H Ed 480 or 481</td>
<td>2</td>
</tr>
<tr>
<td>Elective (Educ 450 or 451 for junior high majors)</td>
<td>2</td>
</tr>
</tbody>
</table>

(The student should have planned his schedule so that directed teaching may be taken either the first or second semester of the senior year.)

Elementary School Majors

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

It is recommended that during the freshman year the prospective elementary education major select only those courses that meet General University Requirements.

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Educ 101 Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Major Requirements</td>
<td>6</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</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>Educ 201 Human Development</td>
<td>4</td>
</tr>
<tr>
<td>Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Major Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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Junior Year

(Interchangeable Semesters)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Educ 305 Elementary Educ</td>
<td>5</td>
</tr>
<tr>
<td>Mus 390 Meth for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>Educ 390 Elem Art Educ</td>
<td>3</td>
</tr>
<tr>
<td>Major Requirements</td>
<td>6</td>
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Second Semester

<table>
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<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Educ 304 Elementary Educ</td>
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</tr>
<tr>
<td>PEP 380 PE for Elem Sch</td>
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<tr>
<td>Major Requirements</td>
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</tr>
<tr>
<td>Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

Senior Year

(Interchangeable Semesters)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First nine weeks</td>
<td></td>
</tr>
<tr>
<td>Educ 403 or 404</td>
<td>3</td>
</tr>
<tr>
<td>H Ed 480 or 481</td>
<td>2</td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
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</tbody>
</table>

Second nine weeks

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ 405 or 406</td>
<td>8</td>
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</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ 401</td>
<td>3</td>
</tr>
<tr>
<td>Hist 455 or Pol S 206</td>
<td>3</td>
</tr>
<tr>
<td>Major Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>4</td>
</tr>
</tbody>
</table>

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

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: 54 hours in technical agriculture to include Ag M 201, 203,
plus 6 hours; Agron 101, plus 3 hours; A S 101, 200, 204, 209; Biom 310; Hort 101; PI P 329; Soils 201. Teachers qualifying to teach agriculture may select a teaching minor in biological science, chemistry, or agricultural mechanization (Ag M 201, 203, 344, plus 6 hours from Ag M 211, 312, 321, 331, or 346). Agriculture majors should consult with an adviser in agricultural education as the professional education requirements for a teaching certificate in vocational agriculture differ from the program for other education majors. When the above requirements plus the requirements for graduation of the College of Agriculture are completed, the student will qualify for a Bachelor of Science degree in Agriculture. There are no teaching minors in vocational agriculture.

Biological Science

Senior High School Major: 34 hours, including at least 8 hours in botany and 8 hours in zoology.

Bio S 103, 104, 330, and Bact 201; at least one course from each of the following fields:

1. Physiology: Bot 320, Zool 352; (2) Ecology: Bot 460, Zool 330, 410; (3) Genetics: Genet 301; (4) Systematics and Evolution: Bot 201, 232, Zool 220, 222; plus additional electives from the preceding field or the following:

Bact 414, 451; Bot 410, 411, 413, 462; Entom 340, 341, 442; Zool 320, 353, 423, 428.

Required minor: 12 hours chemistry including organic; Math 107 or 171 or Biom 412; Phys 101 and 102. If additional courses are taken to satisfy the departmental requirements, the degree should be taken in botany or zoology. If not, it should be in General Studies.

Senior High School Minor: 18 hours.

Bio S 103, 104 (with concurrent enrollment in Chem 101, 102, or 105, 106 required), Zool 330; plus two courses from Bact 201, Bot 232, Zool 220, 222.

Junior High School Major: 28 hours.

Bio S 103, 104, 330; at least one course from each of the following fields: (1) Physiology: Bot 320, Zool 352; (2) Ecology: Bot 460, Zool 330, 410; (3) Genetics: Genet 301; (4) Systematics and Evolution: Bot 201, 232, Zool 220, 222; plus additional electives from the preceding fields or the following:

Bact 201; Bot 411, 413, 462; Entom 340, 341, 442; Zool 320, 353, 423, 428. Required minor: 12 hours chemistry including organic; Astr 135 or Geol 101; Math 107 or 171 or Biom 412; Phys 101 and 102. 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.

Bio S 103, 104 (with concurrent enrollment required in Chem 101, 102, or 105, 106) and two courses from Bact 201, Bot 201, 232, Zool 220, 222.

Business

Senior High School Majors:

Secretarial Major: 47 hours.

Of Ad 102, 203, 206, 208, 209, 210, 215, 220, 223, 320, 325, 326, 327; A B 201, 210, 230, 360; A B 350, Of Ad 345 or 346; A B 231, Econ 320 or 340.

Required courses: Econ 201; Enlg 255; Geog 102 or 105; Psych 101. Students completing this program will receive the Bachelor of Arts degree in Office Administration.

Bookkeeping-Clerical-General Business Major: 45 hours.

Of Ad 101, 102, 203 (2 of 3 courses); 223, 325, 327, 345; A B 201, 210, 230, 231, 311, 315, 320, 360; Econ 320; Cpt S 201; A B 350, Econ 312, or 350. Required courses: Econ 201; Geog 102 or 105; Psych 101. Students completing this program will receive the Bachelor of Arts degree in Business Administration.

Senior High School Minor:

Secretarial Minor: 18-19 hours.

Of Ad 105, 206, 208, or 320 (2 of 4 courses); 101, 102, or 203 (2 of 3 courses); 209, 210, 220, 325, 326.

Bookkeeping-Clerical Minor: 18 hours.

B A 201, 230, 231; Of Ad 101, 102, 203 (2 of 3 courses); Of Ad 215, 325, 327.

General Business-Clerical Minor: 17 hours.

B A 201, 360; Econ 201; Of Ad 101, 102, 203 (2 of 3 courses); Of Ad 215, 325.

Junior High School Minor:

General Business-Clerical Minor: 17 hours.

Same as Senior High School Minor.

Chemistry

Senior High School Major: 30 hours.

Chem 101, 102, 120, or 105, 106, or 111, 212, 217 or 221, 240 or 241; plus additional hours from Chem 242, 243, and 300- and 400-level courses. Required minor: Ph S 330; at least 15 hours of mathematics and physics including either Phys 101, 102, or 201, 202 and Math 107. If additional courses are taken to satisfy the departmental requirements, the degree should be taken in chemistry. If not, it should be in General Studies.
Senior High School Minor: 17 hours.
Ph S 330; at least 15 hours in chemistry from the courses listed under the major.

Child Studies

Elementary School Major: 28 hours.
CFS 247; 342 or 344; 440; 442; 448; Soc 101; plus one course from Anth 101, Geog 102, Psych 201; plus three courses from Anth 358; CFS 401 or 402; Geog 445; Psych 360, 464; Soc 351, 470; Spe 205.

Communications

Journalism

Senior High School Major: 30 hours.
Com 101, 220, 225, 250, 325, 330, 430, and electives in communications to make a total of 30 hours. 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 Communications.
Senior High School Minor: 18 hours.
Com 101, 220, 225, 330, 430, and electives to make a total of 18 hours in communications.

Radio and Television

Senior High School Major: None.
Those interested in preparing for program and production work in broadcasting and those interested in preparing to teach courses in broadcasting in community colleges should consult with the Department of Communications.
Senior High School Minor: 15 hours.
Com 101, 250, 350, 481, and an additional course in communications. Students completing a journalism major and a radio-TV minor and preparing to teach in the public schools should complete an additional teaching minor.

English

Senior High School Major: 36 hours.
Engl 255, 207 or 354; 301; 323; four of the following: Engl 108, 209, 210, 245, 246. At least one course from each of the following groups: Engl 303 or 304, 409, 433, 455; Engl 434, 435, 436; Engl 421, 422, 423, 471. 7 additional hours from Engl 251, 252, 255, 335, and courses numbered above 300. The Department of English recommends that students complete their General University Requirements in humanities and social sciences by selecting a broad range of courses to be chosen after consultation with their adviser. 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 108; 209 or 210; 301; 207, 255 or 354; plus 6 additional hours in courses numbered above 300.

Fine Arts

Senior High School Minor: 17 hours.
F A 101, 105, 121, 123, 129, 152, 230, 255, 259, 265, 269, 212 or 316, 318, 389, 499. 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 Major: 24-30 hours.
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.

Elementary School Major: 30 hours.
F A 101, 105, 121, 123, 129, 152, 212 or 316, 230, 255, 265, 318, 389, 499; Educ 492.

Foreign Languages

Senior and Junior High School Majors: 34 hours (30 hours beyond 102). (A competence equivalent to 204 in a second foreign language or comparable minor in another field is required for the Bachelor of Arts in Foreign Languages.)

French: 203, 204, 311, 320, 321, 322, 333; For L 324; plus 9 hours from Fren 334, 421, 432, 441, 442, 451, 480, 499.

German: 203, 204, 220, 320, 321, 322, 334; For L 324; plus 10 hours from Ger 333, 432, 440, 442, 451, 452, 461, 480, 499.

Russian: 203, 204, 230, 320, 321, 330, or 331; For L 324; plus 12 hours from Rus 330 or 331, 411, 441, 451, 471, 499.

Spanish: 203, 204, 220, 320, 321, 322, 333; For L 324; plus 11 hours from Span 334, 422, 441, 442, 451, 471, 472, 474, 480, 499.

Students who intend to major in foreign languages 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. If the course requirements listed above plus the requirements for graduation in the College of Sciences and Arts are met, the degree will be Bachelor of Arts in Foreign Languages.
Senior and Junior High School Minors: For L 324 and 16 hours of courses taught in a foreign language excluding 101.
For L 324 and Fren, Ger, Rus, or Span 102, 203, 204, plus 4 hours on the 300-400 level; or Lat 101, 102 or 299. In addition it is strongly recommended that the student elect Fren, Ger, or Span 220, or Rus 230.
Elementary School Major: 32 hours (24 hours beyond 102).
French: 203, 204, 220, 311, 320, 321, 322; For L 324; and 4 hours from Fren 333, 334, 421, 432, 441, 442, 451, 480, 499.
German: 203, 204, 220, 320, 321, 322; For L 324; and 7 hours from Ger 333, 334, 432, 440, 442, 451, 452, 461, 480, 499.
Russian: 203, 204, 230, 320, 321; For L 324; Rus 330 or 331 and 6 hours from 411, 414, 415, 471, 499.
Spanish: 203, 204, 220, 320, 321, 322; For L 324; and 8 hours from Span 333, 334, 422, 441, 442, 451, 471, 472, 474, 480, 499.

Geography
Senior or Junior High School Minor: 18 hours.
Geog 102; 220; 345; Hist 455 or Pol S 206; and 6 hours from Geog 311, 315, 321, 323, 331, 332, 333, 445, 449.

Geology
Senior or Junior High School Minor: 17-18 hours.
Geol 101, 250, 252, 302, plus one course from 310, 340, 430.

History
Senior High School Major: 35 hours.
Hist 101, 102, 120, 121; 6 hours from Hist 240, 241, 250, 251; 320; plus 12 hours of additional upper-division work in history including Hist 455. Pol S 206 is required. Both an unrelated and related minor are required with this major. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in History.
Senior High School Minor: 21 hours.
Hist 120, 121 or 101, 102; 6 hours from Hist 240, 241, 250, 251; Hist 455 plus 3 hours of upper-division courses in history; Pol S 206.

Home Economics
Senior High School Major: 45 hours.
CFS 240, 242, 247; plus 2 hours from CFS 342, 344, 440, 446, 447, 448, 449; CFS 350, 355, 450; C T 107, 115, 215; FNIM 120, 130, 266; F A 105; Educ 343, 443; VTE 440; electives to make 45 hours in home economics.

Students wishing a Vocational Home Economics Certificate must complete a total of 45 hours of courses in home economics, and meet the requirements for a bachelor’s degree. Students completing the General University Requirements and 45 hours of courses in home economics as outlined above will receive a Bachelor of Science degree in Home Economics.
Senior High School Minor: 18 hours.
C T 107, 112; CFS 247, 350; FNIM 120, 130; or 15 hours in any one area of home economics as listed under the Senior High School Major.
Junior High School Minor: 18 hours.
CFS 247, 350; C T 107, 112; FNIM 120, 130.

Industrial Arts
Senior High School Major: 45 hours or 31 hours with an approved minor. I A 101, 110, 114, 201, 215, 220, 240, 252, 272, 326, 333, 420; M E 101. Students wishing the 45 hour major will also take I A 342 plus a minimum of 11 hours from I A 212, 316; F A 129, 335, 336; M E 102, 203, 244; C E 101; Arch 220; VTE 440, 460, 470. Students taking the 31 hour major will be required to complete a prescribed minor in mathematics, a science, or social studies. If additional hours can be taken to satisfy the departmental requirements for graduation, the degree should be in Industrial Arts. If not, it should be in General Studies.
Senior High School Minor: 16 hours.
I A 101, 110, 114, 201, 240, 272; M E 101.

Language Arts
Senior High School Major and Minor:
This consists of a major in English with a minor in speech, or a major in speech with a minor in English; see under English and speech.
Junior High School Major: 31 or 32 hours.
Spe 205, 250, 301, 361 or 364; Engi 323 or Spe 435; Engl 108, 207, 255, 301; 2 courses from Engi 332, 333, 334. 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, 301; Engi 255 or Spe 301; Spe 205, 250.

Elementary School Major: 32 hours.
Engi 108; 301; 207 or 255; 2 courses in English numbered above 300; Hum 101 or Engi 445; Hum 103; Spe 250, 364, 371; one course from Spe 205, 301, 325, 375.
Learning Resources

Senior High School Major: None.
Senior High School Minor: 18 hours.
Lib S 201, 202, 301, 401; Educ 310, 445 or 446, 447.

Elementary School Major: 30 hours.
Lib S 201, 202, 301, 401; Educ 445 or 446, 447; Spe 250, 364 or 206; plus electives from the following (covering two fields): Educ 448; F A 105, 152; Cpt S 201; Spe 112, 251, 325, 363.

Mathematics

Senior High School Major: 32 hours.
Math 171, 172, 220, 273, 303, 320, 330, 360; Cpt S 201; plus 3 hours of mathematics electives numbered above 300. If the additional courses can be taken to fulfill the departmental requirements for graduation, the degree should be in mathematics. If not, it should be in General Studies.

Junior High School Major: 29 hours.
Math 171, 172, 220, 273, 303, 320, 330, 360; Cpt S 201. If the additional courses can be taken to fulfill the departmental requirements for graduation, the degree should be in mathematics. If not, it should be in General Studies.

Junior High School Minor: 17 hours.
Math 171, 172, 220, 303, 320.

Elementary School Major: 29 hours.
Math 105, 171, 172, 220, 300, 303, 320, 360; Cpt S 200. If Math 105 or 300 are challenged, one hour of special problem work (Math 499) on curricula should be completed.

Music

Senior or Junior High School Major: 49 hours.
Mus 151, 152, 161, 181, 182, 183 or pass piano proficiency exam, 251, 252, 253, 254, 263, 264, 351, 352, 381, 382, 383, 384, 386 or 387, 389, 480, 482, 483 or 484; 9 hours of elective private lessons. If additional elective hours can be taken to satisfy the departmental requirements for graduation, the degree should be in music. If not, it should be in General Studies.

Senior or Junior High School Minor: 18 hours.
A teaching minor in music may be worked out through consultation with the Department of Music. We recommend the following courses: Mus 151, 152, 160, 251, 252, 253, 254, 480, piano proficiency test, 2 hours in performing groups.

Elementary School Major: 30 hours.
Mus 151, 152, 160, 181, 182, 183 or pass piano proficiency exam, 251, 252, 253, 254, 383, 386 or 387, 390; 4-11 hours of electives in music including at least one course from Mus 265, 351, 480 or 490, and additional courses in piano, percussion, or voice lessons.

Natural Science

Elementary School Major: 36 hours.
Bact 101; Bio S 103, 104; Geol 101; Math 105, 300; Phys 101, 102; a sequence from Chem 101, 102, 120; or 105, 106; or 111, 212. It is recommended that additional courses be chosen from among Astr 135; Bot 232; Geol 250, 302; Zool 220, 222, 251.

Physical Education (For Men)

(H Ed 480 or 481 required of all students who pursue any of the majors or minors listed below.)

Senior or Junior High School Major: 30 hours.
Required courses and competencies: MPE 126 or PEP 195, MPE 127 or PEP 197, CPE 132 or PEP 193, H Ed 261, 263, PEP 381, 382, 465, 466, and 494. Select five from the following courses or competencies: MPE 101 (Volleyball), 102 (Soccer), 105, 107, 115, 117, 146, and 160, plus two hours from the following: PEP 199, 220, 365-368, 393, 506, 488, 489, and H Ed 161. A minor in coaching and one in an unrelated field should be selected. If additional hours can be taken to satisfy the departmental requirements for graduation, the degree should be in physical education. If not, it should be in General Studies.

Senior or Junior High School Minor:
Physical Education: 18 hours.
Required courses and competencies: MPE 126 or PEP 195, MPE 127 or PEP 197, CPE 132 or PEP 193, PEP 381, 382, and 382. Select five from the following courses or competencies: MPE 101 (Volleyball), 102 (Soccer), 105, 107, 115, 117, 146, and 160, plus an additional six hours selected on advice from the Department of Physical Education for Men.

Coaching: 15 hours.
A coaching minor in physical education may be worked out through consultation with the Department of Physical Education for Men.

Physical Education (For Women)

(H Ed 480 or 481 required of all students who pursue any of the majors or minors listed below.)

Senior or Junior High School Major: 30 hours.
PEP 191, 192, 193, 196, 199, 230, 232, 355, 362, 381, 382, 486; Rec 151, 251. Majors
are strongly urged to select a health education minor or one in an unrelated field. If additional hours can be taken to satisfy the departmental requirements for graduation, the degree should be in physical education. If not, it should be in General Studies.

Senior or Junior High School Minors:  
Physical Education: 18 hours.  
H Ed 261; PEP 362, 382; and 5 hours from PEP 191, 192, 196, 230, 232; Rec 151. Zool 251 recommended. Individuals who elect to concentrate in dance may substitute the following: WPE 151, 154, 155, or CPE 158; PEP 257, 355, 362; H Ed 261; Rec 151; and 2 hours from PEP 256, 357; Rec 251.

Health Education: 18 hours.  
H Ed 161, 261, 263, 480 or 481; FNIM 130; Zool 251; and one elective from Soc 150, 160, 270, 340; Psych 201, 360 or 361, 362; Genet 201; H Ed 383. Physical education majors must take Bact 101 or another laboratory science in addition to Zool 251.

Elementary School Major: 30 hours.  
H Ed 261, 263; PEP 191, 192, 196, 198, 230, 232, 254, 355, 362, 381, 382; Rec 151, 251.

Physical Science  
Senior High School Major: 44 hours.  
Chem 101, 102, 120 or 105, 106 or 111, 212; Geol 101; Math 107, 171; 303 or 320; Ph S 330; Phys 101, 102, or 201, 202; plus at least 12 hours from Astr 135; Chem 217, 240, 241; Geol 250, 302; Math 172, 303, 320; 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.

Senior High School Minor: 18 hours.  
Chem 101, 102, 120, or 105, 106 or 111, 212; Ph S 330; Phys 101, 102, or 201, 202.

Junior High School Major: 31 hours.  
Chem 101, 102, 120 or 105, 106 or 111, 212; Math 107, 171; 303 or 320; Ph S 330; Phys 101, 102, or 201, 202; plus at least one course from Astr 135; Chem 217, 240, 241; Geol 101, 250, 302; Math 172, 303, 320; 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, 120, or 105, 106, or 111, 212; Phys 101, 102, or 201, 202.

Physics  
Senior High School Major: 34 hours.  
Phys 201, 202, 303, 310, 320, 330, or 341, 410, 443, 499 (4 hours includes auditing Phys 101 and 102); Ph S 330. 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.

Senior High School Minor: 18 hours.  
Phys 201, 202, 303, 310, 499 (4 hours includes auditing Phys 101 and 102); Ph S 330.

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 455.

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: 15 hours.  
Psych 101, 201, 107 or 390; electives from 300- or 400-level courses; Psych 311 or 362 recommended.

Social Studies  
Senior High School Major: 38 hours.

15 hours from the following including at least three fields: Anth 101; Econ 201; Geog 102, 105; Hist 101, 102, 120, 121; Pol S 101, 102; Soc S 101; Soc 101; Hist 320 and 15 hours from 300- and 400-level courses in the social studies. Hist 455 and Pol S 206 are required for this major. It is strongly recommended that the student select courses which will give as much spread as possible in the fields normally taught in the secondary school. The requirements for graduation of the College of Sciences and Arts should be used to strengthen, broaden, and supplement this major. English 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. 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 foreign language.
Senior High School Minor: 21 hours. 
Poli S 206; 12 hours from Anth 101; Econ 201; Geog 102 or 105; Hist 101, 102, or 120, 121; Poli S 101; Soc 101; Soc S 101. Hist 455; and three additional hours of upper-division social studies.

Junior High School Major: 35 hours. 
Geog 102 or 105; Hist 120, 121; Poli S 206; 3 additional hours of lower-division social studies in addition to General University Requirements; Hist 320 and 15 hours of 300- and 400-level courses in the social studies placing major emphasis on geography and history. Hist 455 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. 
Geog 102 or 105; Hist 120, 121, plus 6 hours from anthropology, history, geography, and political science; Hist 455; Poli S 206.

Elementary School Major: 30 hours. 
Geog 102; Hist 120, 121; 9 hours from Anth 101, 252, 353; Econ 201; Geog 220; Hist 101, 102, 240, 241; Poli S 101; Soc 101; Soc S 101; plus 12 hours of upper-division courses in the social studies. Geog 345 is recommended.

Sociology

Senior High School Minor: 18 hours. 
Soci 101, 160; Hist 455 or Poli S 206; and 9 hours from Soci 330, 340, 351, 362, 370, 371, 374, 410, 480.

Speech

Senior High School Major: 30 hours. 
General Speech: Spe 205, 235, 250 or 260, 262, 301, 435; and 12 hours from 231, 234, 235, 250, 251, 260, 261, 264, 325, 361, 401, 423, 462, 463, 464, 465, 466, 467. 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 Speech.

Speech Pathology: Spe 205, 250, 325, 364, 370, 375, 435, 472, 475 (6 hours). A minor in psychology consisting of Psych 101, 201, and 9 hours from 285, 311, 360, 362, 431, 464, 490 is recommended. 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 Speech.

Senior High School Minor: 15 hours. 
General Speech: Spe 160, 205, 231 or 235, 250, 435.

Elementary School Major (Speech Pathology): 30 hours. 
Spe 205, 370, 375, 472, 475 (6 hours); and 12 hours from Spe 250, 325, 364, 435, 471, 473, 474, 477, 480; Engl 207, 307.

Department of Electrical Engineering


The curriculum in electrical engineering, accredited by the Engineers Council for Professional Development, is designed to give the student a strong basic training in the areas of general interest to all electrical engineers. The flexibility necessary to allow students to study in greater detail in areas of specific interest is provided by the wide range of technical electives that are a part of the curricula. Modern laboratories for electrical circuits, electronics, electrical measurements, energy conversion, and computers are provided. All students are expected to use departmental and university electronic computing equipment, including the IBM 360, as a tool to aid their studies.

The student with particular interest in control systems or automation will be able to choose electives in automatic controls, analog devices, and computer science. Those with an interest in electronics may choose courses in electronic circuits and solid state devices.

Students with interests in medical application of engineering may choose a program strong in chemistry and zoology and complete the course requirements for entry into medical school while obtaining the bachelor's degree in electrical engineering. This training also leads to careers in bioengineering, instrumentation, and research.

The generation, transmission, and utilization of electrical power is a necessity to living in our modern society. Students with an interest in this area should choose technical electives in energy conversion and in power sys-
tems. Computer engineering is an area of interest to many electrical engineers. Students interested in this area should choose electives in digital systems, analog devices, and computer science. The study of electromagnetic waves is of fundamental importance in electrical engineering. An additional course beyond the required level may be taken in the undergraduate program or a complete sequence at the graduate level.

Cooperative education agreements exist between the College of Engineering and certain industries. The student should consult the department chairman if he is interested in the type of program that involves part-time attendance in the university and part-time work in industry. The student should be prepared to extend his studies for an additional year in order to complete this program. Strong supporting courses are available in many departments.

The department offers courses of study leading to the degrees of Bachelor of Science in Electrical Engineering and Master of Science in Electrical Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy (Engineering Science).

## Description of Courses

**E E** *For explanation see Index under "Symbols."

110 Electrical Engineering Orientation 1 (0-3) For freshmen only. Activities, career opportunities, and professional ideals and ethics in engineering; methods and procedures for elementary calculations.

120 Introduction to Electrical Engineering 1 (0-3) Early discoveries and works; Ohm's and Kirchoff's Laws; scope and types of activities in the engineering profession.

261 Electrical Engineering Science 3 Prereq Phys 202; Math 273 or c//; c// in E E 262. Fundamental concepts of electrical science and its utilization in circuits, components, and devices.

262 Electrical Engineering 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.

306 Electrical Engineering Applications 3 Prereq E E 261. For non-majors. Electrical equipment including electronics and machines.

307 Electrical Engineering Laboratory 1 (0-3) Prereq c// in E E 306. For non-majors. Experimental study of electrical machines and electronics.


312 Electronics Laboratory 1 (0-3) Prereq c// in E E 311. Laboratory course to accompany E E 311.

321 Analysis 4 Prereq E E 261; Math 273; Cpt S 201; c// in E E 322. Transient and steady-state analysis of linear systems; Laplace transform techniques; networks, analogs, filters, and transmission line theory.

322 Electrical Circuits Laboratory 2 (1-3) Prereq c// in E E 321. Laboratory applications of E E 321.


365 Electrical Measurements 2 (1-3) Prereq E E 261. Electrical measuring instruments and techniques; bridge methods of measuring circuit parameters; report writing.

401 Electrical Equipment of Buildings 3 I Prereq Phys 102. For Arch majors.

414 Fundamentals of Digital Systems 3 Prereq Math 172; 1 yr Phys. Boolean Algebra; minimization of Boolean functions; realization of combinational and sequential logic circuits; digital system organization and design.


431 Energy Conversion 3 Prereq E E 321, 331, c// in 432. Electromechanical, magnetohydrodynamic, and direct electrical energy conversion.

432 Energy Conversion Laboratory 1 (0-3) Prereq E E 365, c// in 431. The field of energy conversion.

441 Systems Theory 3 Prereq E E 321, c// in E E 442. Behavior of generalized systems; state variable approach; classical mechanics.

442 Systems Laboratory 1 (0-3) Prereq c// in E E 441. The field of systems.

470 Seminar I 1 Prereq senior standing in E E.

Electronic Circuits 3 Prereq E E 311, 321, c// in 477. Circuits with active elements; design of amplifiers, oscillators, and other circuits using semiconductor and vacuum tube devices.

Electronics Laboratory 2 (1-3) Prereq E E 369, c// in 476. Laboratory applications of E E 476.

Seminar II 1 Prereq senior standing in E E. New developments in electrical engineering.

Alternating Current Laboratory 2 (1-3) II Assigned topics in electrical machinery.


Electronic Laboratory 2 (1-3) Prereq c// in E E 486. Laboratory applications of E E 486.

Principles of Automatic Controls 3 II Prereq E E 441 or c//. Analysis, synthesis, stabilization, and optimization of closed-loop systems.

Principles of Power System Analysis 3 I Prereq senior standing in E E. Power system components, their parameters, and the use of symmetrical components in system analysis.

Analog Devices 3 I Prereq E E 321. Design and application of analog computers.

Solid-State Electronics 3 II Prereq E E 311. Semiconductors, ferrites, and dielectrics; their adaptation to engineering applications.

Special Problems 1-4 May be repeated for credit.

Advanced System Analysis 3 Prereq E E 441. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems.

Advanced Automatic Control Theory 3 Prereq E E 489. Nonlinear and sampled data systems; optimization of deterministic systems.

Random Processes in Engineering 3 II Prereq Math 443 or 460. Signal detection; optimum filter theory and spectral analysis of discrete and continuous processes in physical systems.

Power System Protection 3 Measurements, fault detection, logic, relaying, and switching in power systems.

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.

Hybrid Simulation Techniques 3 (2-3) Prereq E E 494. Complex systems with the aid of a hybrid computer.

Advanced Digital System Design 3 Prereq E E 414. Realization of modern developments in digital system design; associative memory, pattern recognition; special purpose input-output devices; parallel computing techniques.

Ultra-High Frequency Engineering 3 Components and systems at frequencies over 300 megahertz.

Advanced Electromagnetic Theory II Guided waves, inhomogeneous wave equation, radiation, relativistic electrodynamics, plasma kinetic theory, and momentum equations for a plasma.

Power System Analysis 3 I Operation and control of power systems.

Electronic Power Converters 2 or 3 Characteristics, circuits, analysis, and design of converters containing power transistors; SCR's and power diodes. Cooperative course taught at the University of Idaho.

Antenna Theory 3 II Prereq E E 541. Linear cylindrical dipole antennas as radiating, receiving, scattering elements; current and charge distribution, input impedance, electromagnetic fields; coupled antenna arrays.

Wave Propagation I 3 Prereq E E 542 or c//. Theory of radio wave propagation in a magnetionic medium; application of communication problems involving the earth's ionosphere.

Wave Propagation II 3 I Prereq E E 528. Phenomena occurring within the solar-terrestrial environment; dynamics of and wave propagation in the magnetosphere.

Dielectric Theory 3 I Field theory, phenomena, anomalous properties, and application of dielectrics.

Communication Theory I 3 or 4 Discrete receiver principles; channel constraints; binary communication techniques; fading and scattering media; optimum reception of continuous waveform modulated signals. Cooperative course taught at the University of Idaho.
Communication Theory II 2 or 3 Hypothesis testing; optimal detection of signal in noise; sequential detection; maximum likelihood estimation; spatial processing; data reduction techniques. Cooperative course taught at the University of Idaho.

Network Synthesis I 3 Positive-real function; physical realizability of passive networks; properties of and synthesis procedures for driving-point immitances and transfer functions.

Network Synthesis II 3 Prereq E E 561. Additional synthesis procedures; the approximation problem.

Advanced Topics in Power Engineering 1-3 May be repeated for credit.

Advanced Topics in System and Circuit Theory 1-3 May be repeated for credit.

Advanced Topics in Electromagnetics 1-3 May be repeated for credit.

Directed Study in Electrical Engineering 1-3 Opportunity for students and faculty to investigate current topics of common interest. Cooperative course taught at the University of Idaho.

Special Problems 1-4 May be repeated for credit.

Research, Thesis, or Examination Variable credit.

COOPERATIVE COURSES TAUGHT AT THE RICHLAND CENTER FOR GRADUATE STUDY

Solid State Electronics I 3 Dirac notation, many-body techniques lattice vibrations, phonons and transport theory; irreversible thermodynamics; dielectric and magnetic properties of materials; superconductivity.

Solid State Electronics II 3 Prereq E E 531. Devices and phenomena of current interest.

Semiconductor Circuits 3 Transistor characterization; analysis and design of discrete and integrated semiconductor circuits; includes laboratory assignment.

Noise in Electronic Devices 2 Physical mechanics of noise generation in electrical devices; characterization of noise, noise figure, temperature, and measurements; application to transistors and lasers.

Information Theory and Coding I 2 Prereq E E 507. Mathematical theory of communication; information theory for discrete and continuous systems; channel capacity and coding.

Schedule of Studies

At least 50 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>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>E E 110 Orientation</td>
<td>1</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio S 101 Integrated</td>
<td>3</td>
</tr>
<tr>
<td>Chem 106 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 172 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>E E 120 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Phys 201 Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Math 220 Int Linear Algebra</td>
<td>3</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>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
<td>4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 273 Calc and Diff Equat</td>
<td>4</td>
</tr>
<tr>
<td>Cpt S 201 Int Computer Prog</td>
<td>2</td>
</tr>
<tr>
<td>C E 212 Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>E E 261 Elec Engr Science</td>
<td>3</td>
</tr>
<tr>
<td>E E 262 Elec Engr Lab</td>
<td>1</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

Junior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>E E 321 Analysis</td>
<td>4</td>
</tr>
<tr>
<td>E E 322 Elec Circuit Lab</td>
<td>2</td>
</tr>
<tr>
<td>E E 331 Fields and Waves</td>
<td>3</td>
</tr>
<tr>
<td>E E 365 Measurements</td>
<td>2</td>
</tr>
<tr>
<td>M E 301 Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S 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>E E 311 Electronics</td>
<td>4</td>
</tr>
<tr>
<td>E E 312 Electronics Lab</td>
<td>1</td>
</tr>
<tr>
<td>E E 431 Energy Conversion</td>
<td>3</td>
</tr>
<tr>
<td>Phys 303 Mod Engr Physics</td>
<td>3</td>
</tr>
<tr>
<td>M E 203 Metals Processing</td>
<td>1</td>
</tr>
<tr>
<td>E E 470 Seminar</td>
<td>1</td>
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</table>

Approved Technical Elective*
Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>E E 432 Energy Conv Lab</td>
<td>1</td>
</tr>
<tr>
<td>E E 441 Systems</td>
<td>3</td>
</tr>
<tr>
<td>E E 442 Systems Lab</td>
<td>1</td>
</tr>
<tr>
<td>E E Elective and Lab</td>
<td>5</td>
</tr>
<tr>
<td>Met 302 Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>E E 480 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>E E Elective and Lab</td>
<td>5</td>
</tr>
<tr>
<td>M E 326 Energy Transport</td>
<td>3</td>
</tr>
<tr>
<td>Approved E E Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

*Technical electives should be chosen from E E 414, 421, 475, 476, 477, 482, 486, 487, 489, 491, 494, 496.*

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

Transfer Students

Students planning to transfer from other institutions (except those institutions accredited by ECPD) to electrical engineering at Washington State University should plan on spending three years at Washington State to earn the bachelor's degree. This is desirable because of sophomore professional requirements, course sequences, the need for engineering physics, and good preparation in mathematics.

Preparation for Graduate Study

Before undertaking graduate study in electrical engineering, a student should have completed substantially the equivalent of the above schedule of studies. The program in engineering science allows students from other areas to enter this interdepartmental program.

Department of English


The curriculum of the Department of English is designed for students who desire a broad education emphasizing language and literature, students who wish specific training in the teaching of language and literature, and students who are interested in preparing for graduate study in English.

Students who are preparing to reach English in the public schools of Washington should examine the summary of requirements for majors and minors listed in the announcement of 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 in English, Master of Arts in English, Master of Arts in the Teaching of English, and Doctor of Philosophy. The Department of English, in cooperation with the Department of History, offers the degree of Doctor of Philosophy (American Studies). In cooperation with the Department of Foreign Languages, it offers the degree of Doctor of Philosophy (Literary Studies).

Description of Courses

Engl  For explanation see Index under "Symbols"

101 [C] English Composition 3 The writing of correct, coherent English prose, stressing orderly development of thought and precise exposition of both abstract and concrete subject matter.

103 [C] English for Foreign Students 3 May be repeated for 6 hours credit. English grammar, composition, and pronunciation for the foreign student.

108 [H] Introduction to Literature 3 Short story, novel, poetry, and plays.

198 [C] English Composition Honors 3 I

199 [H] English Composition and Literature Honors 3 Prereq Engl 198.

201 [C] Intermediate Composition 3 Prereq Engl 101. Not open to freshmen. For students who wish to improve their skills in expository writing.

207 The Organization of English 3 I The phonology, morphology, and syntax of English, especially contemporary American.

209 [H] Survey of English Literature to 1750 3

210 [H] Survey of English Literature 1750 to 1900 3

245 [H] American Literature to 1855 3

246 [H] American Literature since 1855 3
251 Creative Writing: Prose 3 Prereq Engl 101.
252 Creative Writing: Poetry 3 Prereq Engl 101.
303 [H] Shakespeare 3 Shakespearean drama to 1600.
304 [H] Shakespeare 3 Shakespearean drama after 1600.
307 Readings in Linguistics 3 II Prereq Engl 207. Current topics in English linguistics.
308 Introduction to Literary Criticism 3 II Major approaches to the study of literature.
320 Black Literature in America 3 II Studies in modern black writers.
332 [H] Poetry: Twentieth Century 2 20th century poetry, including Continental.
333 [H] Fiction: Twentieth Century 2 20th century fiction, including Continental.
334 [H] Drama: Twentieth Century 2 20th century drama including Continental.
335 (235) [H] The Bible as Literature 3
354 (454) History of the English Language 3 I Prereq 1 yr For L. Language related to the origin, history, and literature of its speakers.
401 Advanced Writing 3 Advanced problems in writing: essay, criticism, and research.
409 English Drama 3 I English drama to 1660.
410 English Drama 3 II English drama from 1660 to 1920.
422 Victorian Poetry 3 Tennyson, the Brownings, Arnold, the Rossettis, Swinburne, and others.
423 Nineteenth Century Prose 3 I English nonfiction writers of the nineteenth century.
427 The English Novel from Defoe to Meredith 3 I
428 The English Novel from Meredith to the Present 3 II
429 American Fiction to 1900 2 or 3 I Prereq Engl 245 or 246.
430 American Fiction since 1900 3 II Prereq Engl 245 or 246.
432 American Drama 3 I
433 The English Renaissance 2 or 3 I Nondramatic literature of the period 1500 to 1600.
434 The Later English Renaissance 3 II Nondramatic literature, including Milton, of the period 1600 to 1660.
435 The Age of Dryden and Pope 3 I
436 The Age of Johnson 3 II
445 European Literature in Translation 3 I Greek and Roman masterpieces.
446 European Literature in Translation 3 II Italian, French, German, Spanish, and Russian masterpieces.
451 Advanced Creative Writing: Prose 3 May be repeated for 6 hours credit.
452 Advanced Creative Writing: Poetry 3 May be repeated for 6 hours credit.
455 Chaucer 3 II
470 The West in American Literature 3 II 1970-71 a/y. Prereq Engl 245 or 246.
471 The American Romantic Movement 3 I Prereq Engl 245 or 246.
472 American Poetry 3 II 1971-72 a/y. Prereq Engl 245 or 246.
490 Seminar in Literature 3 For seniors only.
499 Special Problems 1-4 May be repeated for credit.
507 Shakespeare 3 II Plays, poems, criticism, and background materials.
511 Seminar in Colonial and Provincial Literature 3 I 1970-71 a/y.
512 Literary Theory and Research 3 II 1970-71 a/y.
513 Seminar in American Studies 3 May be repeated for credit. Same as Hist 513.
522 Seminar in Nineteenth Century English Literature 3 II
525 Seminar in English Literature of the Seventeenth Century 3 I
527 Seminar in English Literature of the Restoration and Eighteenth Century 3 II
529 Nineteenth Century American Fiction 3 May be repeated for credit. II
537 Seminar in English Literature 3 May be repeated for credit.
547 Literary Criticism 3 I Theories of literature from Plato and Aristotle to the
present.

48 Seminar in Literary Criticism 3 May be repeated for credit. II Theories of literature in the 20th century.

49 Twentieth Century Prose Fiction 3 I American and selected English masterpieces of the 20th century.

50 Seminar in Twentieth Century Poetry 3 I

51 Twentieth Century Drama 3 I 1971-72 a/y.

54 The History of the English Language 3 II 1971-72 a/y.

55 Seminar in Middle English Literature 3 II

56 Seminar in Tragedy 3 II 1970-71 a/y.

56 Seminar in Comedy 3 II 1971-72 a/y.

56 Seminar in Lyric Poetry 3 I 1970-71 a/y.


57 Seminar in Major American Writers 3 May be repeated for credit.

58 Medieval Literature 3 I The literature of western Europe from 450 to 1500.

59 Seminar in Literary Studies 3 May be repeated for credit. Same as For L 591.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

Exclusive of English 101, an English major must complete 36 hours in English. At least 18 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

During the freshman and sophomore years a student should complete:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>The required four courses in science</td>
<td>12-15</td>
</tr>
<tr>
<td>Twelve of the 21 required hours in social sciences and humanities (exclusive of courses in English)</td>
<td>12</td>
</tr>
<tr>
<td>Four of the following:</td>
<td></td>
</tr>
<tr>
<td>Engl 108 (or 199), 209, 210, 245, 246</td>
<td>12</td>
</tr>
</tbody>
</table>

During the junior and senior years majors should complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>The remainder of the 21 hours required in social sciences and humanities (exclusive of courses in English)</td>
<td>9</td>
</tr>
<tr>
<td>Twenty-four hours in English distributed as follows: Engl 301 Adv Essay Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

At least one course from each of the following three groups:

Engl 303, 304, 409, 433, 455; Engl 427, 434, 435, 436; Engl 421, 422, 423, 471

Twelve hours from the following:

Engl 207, 251, 252, 255 and courses numbered above 300 12

Preparation for Graduate Study

Students interested in a graduate program in English at Washington State University should offer preparation in English courses generally approximating the undergraduate program described above. Students with undergraduate majors in such subjects as philosophy, foreign languages, and history as well as those with undergraduate majors in English may be accepted for graduate study in the department. Every student should be well grounded in at least one modern foreign language.

Department of Entomology

Professor and Chairman of the Department, R. F. Harwood; Professors, M. T. James, C. A. Johansen, H. S. Telford; Associate Professors, R. D. Akre, A. A. Berryman; Assistant Professor, C. F. Soo Hoo.

The entomology curriculum and facilities provide opportunities for learning and research in the basic and applied aspects of the study of insects. Courses are designed for majors and nonmajors, providing supplementary training for those students in agriculture, education, veterinary medicine, bacteriology, and natural sciences.

The suggested curriculum is intended to prepare students for further graduate study or for employment with county, state, or federal governments and to give specialized training for those students wishing to become field-men or chemical company representatives. Students interested in agricultural applications of entomology aimed at employment after the bachelor’s degree would probably substitute Biol 310, Soils 201, Pl P 329 and 401, and Agron 305; the foreign language might be deleted. There is a need for entomologists trained at all levels, in both applied and basic research as well as teaching.

Facilities are available for graduate study in the major areas of entomology: apiculture, behavior, biological control, economic entomology, ecology, forest entomology, insect-plant relationships, medical entomology, morphology, physiology, taxonomy, and toxicology. Extensive insect collections are available for support of 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**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>340</td>
<td>Agricultural Entomology 3 (2-3) II</td>
<td>Prereq Bio S 103, 104. Control, identification, and biology of crop and animal pests. Credit not granted for both Entom 340 and 343.</td>
<td></td>
</tr>
<tr>
<td>343</td>
<td>General Entomology 2 I</td>
<td>Prereq a general course in biological sciences. Identification and biology of insects and related arthropods.</td>
<td></td>
</tr>
<tr>
<td>344</td>
<td>General Entomology Laboratory 1 (0-3) I</td>
<td>Prereq Bio S 103, 104.</td>
<td></td>
</tr>
<tr>
<td>348</td>
<td>Forest Entomology 3 (2-3) I</td>
<td>Same as for 348.</td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>Aquatic Entomology 3 (1-6) II 1970-71 a/y.</td>
<td>Prereq Entom 340 or 343.</td>
<td>Identification and biology of insects associated with aquatic and subaquatic environments. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>441</td>
<td>Systematic Entomology I 3 (1-6)</td>
<td>Prereq Entom 340, 343 or 10 hrs Zool. Classification and identification of the minor orders of insects.</td>
<td></td>
</tr>
<tr>
<td>442</td>
<td>Systematic Entomology II 3 (1-6) II</td>
<td>Prereq Entom 340, 343 or 10 hrs Zool. Classification and identification of the major orders of insects.</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>Entomological History and Literature 2 II 1970-71 a/y.</td>
<td>Prereq Entom 340 or 343.</td>
<td>Principal literature and a review of significant events in biology and entomology.</td>
</tr>
<tr>
<td>444</td>
<td>External Insect Morphology 3 (1-6) I</td>
<td>Prereq Entom 340 or 343.</td>
<td>Comparative external morphology of insects.</td>
</tr>
<tr>
<td>445</td>
<td>Internal Insect Morphology 3 (1-6) I</td>
<td>Prereq Entom 340 or 343.</td>
<td>Gross and tissue characteristics of internal structures; embryology.</td>
</tr>
<tr>
<td>446</td>
<td>Insect Toxicology 2 II 1970-71 a/y.</td>
<td>Prereq Entom 340, 343; Org Chem. Principles, insecticide chemistry, analysis, equipment, phytotoxicity, vertibrate toxicity, mode of action, and resistance.</td>
<td></td>
</tr>
<tr>
<td>447</td>
<td>Insect Toxicology Laboratory 2 (0-6) II 1970-71 a/y.</td>
<td>Prereq Entom 340, 343; Org Chem. Exercises in phytotoxicity, chemical analysis, dosage-mortality studies, and individual projects.</td>
<td></td>
</tr>
<tr>
<td>448</td>
<td>Medical Entomology 3 (2-3) I</td>
<td>Prereq Bio S 103, 104.</td>
<td>Insects and related arthropods in relation to human health; means of control.</td>
</tr>
<tr>
<td>449</td>
<td>Biological Control 2 II 1971-72 a/y.</td>
<td>Prereq Entom 340 or 343.</td>
<td>Concepts and principles of biological control of insects; use of insects for control of plant and animal pests.</td>
</tr>
<tr>
<td>450</td>
<td>Advanced Agricultural Entomology 4 (2-6) I 1971-72 a/y.</td>
<td>Prereq Entom 340 or 343.</td>
<td>Identification and biology of fruit, vegetable, and field crop insects; control programs.</td>
</tr>
<tr>
<td>451</td>
<td>Insect Physiology 4 (3-3) II 1971-72 a/y.</td>
<td>Prereq Chem 240; Entom 340 or 343. Principal arthropod organs and organ systems; the Insecta, including certain physiological aspects of insect toxicology.</td>
<td></td>
</tr>
<tr>
<td>452</td>
<td>Pesticides and the Environment 2 I 1970-71 a/y.</td>
<td>Prereq 12 hrs biological sciences. Immediate and prolonged effects of pesticides on man and other animals; legal and moral repercussions of pesticide use.</td>
<td></td>
</tr>
<tr>
<td>498</td>
<td>Advanced Entomology 3 II Prereq Entom 340 or 343.</td>
<td>Prereq 12 hrs biological sciences. Immediate and prolonged effects of pesticides on man and other animals; legal and moral repercussions of pesticide use.</td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Special Problems 1-4 I</td>
<td>Prereq 12 hrs biological sciences. Immediate and prolonged effects of pesticides on man and other animals; legal and moral repercussions of pesticide use.</td>
<td></td>
</tr>
<tr>
<td>513</td>
<td>Entomological Research Methods 3 I</td>
<td>Prereq Entom 340 or 343.</td>
<td>Principles of entomological research; procedures and techniques of studying insects in field and lab; measuring of physical environmental factors. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>540</td>
<td>Taxonomy of Immature Insects 4 (1-9) II 1971-72 a/y.</td>
<td>Prereq Entom 442.</td>
<td>The orders and families of insects as distinguished by characters of eggs, nymphs, larvae, and pupae.</td>
</tr>
</tbody>
</table>
Insect Behavior 3 (2-3) II 1971-72 a/y.  
Prereq 10 hrs Entom. Principles of behavior of insects; orientation to environmental conditions.

Insect Ecology 4 (3-3) II 1970-71 a/y.  
Prereq Entom 340, 343, or 451. Physiological responses of insects to environmental conditions; concepts and principles of population and community ecology.

Advanced Forest Entomology 2 II 1971-72 a/y. Same as For 548.

Seminar 1 May be repeated for credit.  
Prereq 20 hrs biology. Reporting problems and research in entomology.

Special Problems 1-4 May be repeated for credit.

Research, Thesis, or Examination Variable credit.

### Schedule of Studies

At least 20 of the total hours required for the bachelor's degree in this program must be upper-division courses.

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
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<tr>
<td>Chem 101 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 107 or 171</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>E</td>
<td>1/2</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio S 104 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Chem 102 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Comp, Engl, or Spe Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>E</td>
<td>1/2</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>Comp, Engl, or Spe Elective</td>
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<tr>
<td>Chem 241 Organic</td>
<td>5</td>
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<tr>
<td>Econ 201 Principles</td>
<td>4</td>
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<td>Hum or Soc S Elective</td>
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<td>ROTC or Elective</td>
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<td>E</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fact 201 Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>Chem 242 Organic</td>
<td>3</td>
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<tr>
<td>Chem 243 Organic Lab</td>
<td>2</td>
</tr>
<tr>
<td>Biom 310 Ag Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
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<tr>
<td>E</td>
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### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Entom 343 General</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td>Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Entom Elective</td>
<td>2-4</td>
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<tr>
<td>Bot 232 or 320</td>
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<tr>
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### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Entom 441 Systematic I</td>
<td>3</td>
</tr>
<tr>
<td>For L Elective*</td>
<td>4</td>
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<tr>
<td>Elective</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entom 442 Systematic II</td>
<td>3</td>
</tr>
<tr>
<td>For L Elective*</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>10</td>
</tr>
</tbody>
</table>

*May be satisfied by two years of acceptable high school foreign language.

Students preparing for graduate study may elect from Chem 364, 366; Genet 301, 302; Math 171; Phys 101, 102; and animal or plant physiology.

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

### Preparation for Graduate Study

As preparation for work toward an advanced degree, a student should have completed an undergraduate major in some field of biological science, chemistry, forestry, or agriculture; his background work should include a year each of zoology, botany, or an integrated course in the biological sciences, a basic course in entomology, plant or animal physiology, and organic chemistry. His background in mathematics should be such as to qualify him for continuing either with calculus or biometry. He should have had prerequisites for graduate work in his minor or supporting areas; for example, basic plant pathology or microbiology if he is to enter either of those fields.

### Program in Environmental Science

Professor and Chairman of the Program, R. A. Parker.

Environmental science is a multidisciplinary field concerned with the analysis of natural and modified environments and their interactions with biological communities, including the human community. The Program in En-
vironmental Science involves cooperating members from ten departments in the Colleges of Agriculture, Engineering, and Sciences and Arts.

Through the program students acquire an extensive background and a broad perspective that prepares them for a variety of roles in the study and management of the environment and its specific resources. In-depth training is obtained within any one of six optional areas of specialization, including agricultural ecology, biological science, cultural ecology, environmental health, natural resources, and physical science. Because many departments contribute to the curriculum it is not feasible to present here a description of all courses available in the program.

The course of study leads to the degrees of Bachelor of Science in Environmental Science and Master of Science in Environmental Science.

**Description of Courses**

- **Env S For explanation see Index under “Symbols”**
- 493 Seminar 1 May be repeated for credit.
- 499 Special Problems 1-4 May be repeated for credit.
- 520 Special Topics 2 May be repeated for 6 hours credit.
- 599 Special Problems 1-4 May be repeated for credit.
- 600 Research, Thesis, or Examination Variable credit.

**Schedule of Studies**

At least 35 of the total hours required for the bachelor's degree in this program must be in upper-division courses. In addition to the General University Requirements, a student must complete 18 hours in one of the six areas of specialization listed above.

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Chem 101 or 105</td>
<td>4</td>
</tr>
<tr>
<td>Math 107 or 201</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Soc 101 or Anth 101</td>
<td>3</td>
</tr>
<tr>
<td>Bio S 104 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Chem 102 and 120, or 106</td>
<td>4-6</td>
</tr>
<tr>
<td>Math 171 or 202</td>
<td>3-4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
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**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 101 or 201</td>
<td>4</td>
</tr>
<tr>
<td>Chem 240 or 241</td>
<td>4-5</td>
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<tr>
<td>Geol 101 Introductory</td>
<td>4</td>
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<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
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<td>P E</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Phys 102 or 202</td>
<td>4</td>
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<tr>
<td>Anth 254 Anth and World Prob</td>
<td>2</td>
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<tr>
<td>Bact 101 or 201</td>
<td>4</td>
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<tr>
<td>Soils 201 Soils</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

**Junior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Genet 301 Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Bot 320 or Zool 352</td>
<td>3-4</td>
</tr>
<tr>
<td>Pub H 299 Pub H Prob</td>
<td>1</td>
</tr>
<tr>
<td>Cpt S 201 Computer Prog</td>
<td>2</td>
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<tr>
<td>Elective</td>
<td>6-7</td>
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<tr>
<td>Env S 493 Seminar²</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Geog 311 Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>Biom 412 Biometry</td>
<td>3</td>
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<tr>
<td>Elective</td>
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<td>Env S 493 Seminar²</td>
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**Senior Year**

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<th>First Semester</th>
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<tr>
<td>For L or Elective³</td>
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<tr>
<td>Elective¹</td>
<td>6-7</td>
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<tr>
<td>C E 341 Env Health Engineering</td>
<td>4</td>
</tr>
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<td>Env S 493 Seminar²</td>
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<table>
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<th>Second Semester</th>
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<tbody>
<tr>
<td>Soc 430 World Pop</td>
<td>3</td>
</tr>
<tr>
<td>For L or Elective³</td>
<td>4</td>
</tr>
<tr>
<td>Bot 460 Auteology</td>
<td>3</td>
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<tr>
<td>Elective</td>
<td>5-7</td>
</tr>
<tr>
<td>Env S 493 Seminar²</td>
<td>1</td>
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</tbody>
</table>

¹Econ 201 and 472 recommended.
²Other appropriate departmental seminars may be substituted with the consent of the student's adviser.
³Eight hours of a modern foreign language required unless student has completed two years of such language training in high school.

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

**Preparation for Graduate Study**

As preparation for work toward the Master of Science degree in Environmental Science, a student should have completed an undergraduate major in which he has studied a physical, biological, or social system in sufficient depth.
to provide a basis for advanced examination in one or more of these systems in an ecological context. Students with majors in a variety of fields in the pure and applied natural sciences, social sciences, environmental sciences, and engineering sciences are thus eligible for admission to the master's program, but may expect in all cases to conform to a course of study assuring a large-scale ecological perspective as the frame of reference for their area of specialization.

Department of Fine Arts
of the School of Music and Fine Arts

Professor and Chairman of the Department, L. Monaghan; Professors, G. A. Latsner, A. L. Lofmeister, R. Sterling; Associate Professors, J. Feasley, G. C. Hansen, R. Thornton; Assistants Professors, D. Anawalt, J. Balyeat, G. Bogdanovich, R. Ecker, F. Ho, A. Okazaki.

The programs of study in art include professional art training, art education, and general art training. The courses of study are designed for a maximum of professional development in art while allowing for a wide choice of other subjects toward a broad general education.

In the professional art training course, the student may choose to specialize in ceramics, graphic design, jewelry, painting, printmaking (etching, lithography, silkscreen), or sculpture.

The department offers courses of study leading to the degrees of Bachelor of Arts in Fine Arts, Master of Fine Arts, and Master of Fine Arts in the Teaching of Fine Arts.

Description of Courses

A For explanation see Index under "Symbols"

01 [H] Introduction to Art 2 or 3 Major and minor arts; emphasis on contemporary period.

05 Basic Design 2 (0-6) Elements and principles; lines, points, spaces, textures, lights and darks, and colors; their application to art problems.

21 Drawing 2 (0-6) Elements and principles.

23 Figure Drawing 2 (0-6) Drawing from the human figure and the study of its anatomical structure.

129 Volume Design 2 (0-6) Three-dimensional design; use of hand and machine tools on metal, wood, clay, plaster, and other materials.

152 Lettering 1 (0-3) Historical study of calligraphy with emphasis on italic writing.

206 Advanced Design 2 (0-6) Prereq F A 105, 121. Composition and color structure.

208 [H] Introduction to Art History 3 Historical survey of visual arts in western world from 5th century B.C. to 1500 A.D.

209 [H] Introduction to Art History 3 Historical survey of visual arts in western world from 1500 A.D. to the present.

212 (208) [H] Ancient Art 2 or 3 Painting, sculpture, and architecture from 5th century B.C. to 4th century A.D.

214 [H] Medieval Art 3 Painting, sculpture, and architecture from 4th century B.C. to 1500 A.D.

222 (122) Drawing 2 (0-6) Prereq F A 121.

224 Figure Drawing 2 (0-6) Prereq F A 123. Drawing from the human figure.

230 (130) Sculpture 2 (0-6) Prereq F A 121. Modeling in clay; casting techniques.

253 (153) Lettering 1 (0-3) Historical study of lettering and basic typography.

255 (155) Water-Color Painting 2 (0-6) Prereq F A 105, 121. Experimentation in various water-color techniques.

259 Oil Painting 2 (0-6) Prereq F A 255 or 206.

265 (165) Jewelry Design 1 (0-3) or 2 (0-6) Prereq F A 105. Using silver and other metals; setting of semi-precious stones; rings, pendants, bracelets, and pins.

266 Jewelry Design 1 (0-3) or 2 (0-6) Prereq F A 265.

269 Layout and Typography 2 (0-6) Prereq F A 105, 121, 152 or 253. Principles of layout design, symbolism, and typography.

316 (209) [H] Renaissance Art 2 or 3 Painting, sculpture, and architecture in western Europe from the 14th through the 16th century.

318 (210) [H] Modern Art 2 or 3 Painting, sculpture, and architecture from 19th to the 20th century.

320 [H] American Art 3 American painting, sculpture, architecture and decorative arts from early colonial period to the present.
325 Figure Drawing 2 (0-6) Prereq F A 224. Advanced.
331 (231) Sculpture 2 (0-6) Prereq F A 230. Wood, metal, and other materials.
335 (235) Ceramics 2 (0-6) Prereq F A 105. Forming processes; the potter's wheel; glazing; firing.
349 Printmaking 2 (0-6) Prereq F A 222, 356.
356 (256) Water-Color Painting 2 (0-6) Prereq F A 255. Experimentation in various water-color techniques.
360 Oil Painting 2 (0-6) Prereq F A 259.
367 Jewelry Design 1 (0-3) or 2 (0-6) Prereq F A 266.
370 Graphic Design 2 (0-6) Prereq F A 269. Visual communication in TV graphics, typography, and photography.
389 (189) Art Mediums for Schools 2 (0-6) Required in art education. Experiences in a variety of mediums that are utilized in public schools.
432 (332) Sculpture 2 (0-6) Prereq F A 331. Advanced work in wood, metal, and other materials.
433 Sculpture 2 (0-6) Prereq F A 432. Advanced.
436 (336) Ceramics 2 (0-6) Prereq F A 335. Glaze calculation; decorative techniques.
437 Advanced Ceramics 2 (0-6) Prereq F A 436.
450 (350) Printmaking 2 (0-6) Prereq F A 349. Individual development; choice of medium.
457 (357) Water-Color Painting 2 (0-6) Prereq F A 356.
458 Water-Color Painting 2 (0-6) Prereq F A 437.
461 (361) Oil Painting 2 (0-6) Prereq F A 360.
462 Oil Painting 2 (0-6) Prereq F A 461. Experimentation in various techniques.
463 Oil Painting 2 (0-6) Prereq F A 461.
471 Illustration 2 (0-6) Prereq F A 269. Advertising, editorial, and technical illustration.
472 Advanced Illustration 2 (0-6) Prereq F A 471. Specialization in particular areas.
473 Graphic Design 2 (0-6) Prereq F A 370.
474 Advanced Graphic Design 2 (0-6) Prereq F A 473.
498 Seminar 2 (0-6) May be repeated for 4 hours credit. Prereq F A 208, 209, or 318. Seniors in art and graduate students only.
499 Special Problems 1-4 May be repeated for credit.
500 Advanced Oil Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
501 Advanced Oil Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
502 Advanced Oil Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
505 Advanced Water-Color Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
506 Advanced Water-Color Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
507 Advanced Water-Color Painting 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
510 Advanced Sculpture 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
511 Advanced Sculpture 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
512 Advanced Sculpture 2 (0-6) May be repeated for 6 hours credit. Prereq F A 462.
515 Advanced Graphic Design 2 (0-6) May be repeated for 6 hours credit. Prereq F A 474.
516 Advanced Graphic Design 2 (0-6) May be repeated for 6 hours credit. Prereq F A 474.
517 Advanced Graphic Design 2 (0-6) May be repeated for 6 hours credit. Prereq F A 474.
520 Advanced Printmaking 2 (0-6) May be repeated for 6 hours credit. Prereq F A 450.
521 Advanced Printmaking 2 (0-6) May be repeated for 6 hours credit. Prereq F A 450.
522 Advanced Printmaking 2 (0-6) May be repeated for 6 hours credit. Prereq F A 450.
525 Advanced Ceramics 2 (0-6) May be repeated for 6 hours credit. Prereq F A 437.
526 Advanced Ceramics 2 (0-6) May be repeated for 6 hours credit. Prereq F A 437.
527 Advanced Ceramics 2 (0-6) May be repeated for 6 hours credit. Prereq F A 437.
530 Advanced Art History 2 May be repeated for 6 hours credit. Prereq 9 hrs of undergraduate art history.
Special Problems 1-4 May be repeated for credit.
Research, Thesis, or Examination Variable credit.

Schedule of Studies
At least 18 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Professional Art Training
Freshman Year
First Semester
F A 101 Introduction 3
F A 121 Drawing 2
F A 105 Basic Design 2
General Univ Requirements 7
ROTC or Elective 2
P E 1/2
Hours
Second Semester
F A 222 Drawing 2
F A 123 Figure Drawing 2
General Univ Requirements 10
ROTC or Elective 2
P E 1/2

Sophomore Year
First Semester
F A 129 Volume Design 2
F A 255 Water-Color 2
F A 224 Figure Drawing 2
F A 230, 259, or 269 2
General Univ Requirements 6
ROTC or Elective 2
P E 1/2
Hours
Second Semester
F A 208 or 209 3
F A 356 Water-Color 2
F A 351, 259, or 269 2
General Univ Requirements 7
ROTC or Elective 2
P E 1/2

Junior Year
First Semester
F A Art History Elective 3
F A 325 Figure Drawing 2
F A 335 or 349 2
General Univ Requirements 9
Hours
Second Semester
F A 457 Water-Color 2
F A Elective 4
Phil 101 Introduction 3
General Univ Requirements 7
Senior Year
First Semester
F A Art History Elective 3

F A 498 Seminar 2
F A Elective 3
Elective 8
Second Semester
F A 498 Seminar 2
F A Elective 10
Elective 4

At the second-semester sophomore level the student selects a field of specialization by taking courses from the following fields:

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

Art Education
Freshman Year
First Semester
F A 101 Introduction 3
F A 121 Drawing 2
Elective 3
General Univ Requirements 6
ROTC or Elective 2
P E 1/2
Hours
Second Semester
F A 123 Figure Drawing 2
F A 129 Volume Design 2
Educ 101 Introduction 2
General Univ Requirements 8
ROTC or Elective 2
P E 1/2

Sophomore Year
First Semester
F A 152 Lettering 1
F A 230 Sculpture 2
F A 222 Drawing 2
Elective 3
General Univ Requirements 4
F A Elective 2
ROTC or Elective 2
P E 1/2
Hours
Second Semester
F A 255 Water-Color 2
Educ 201 Human Devel 4
Psych 101 Prin of Behavior 3
General Univ Requirements 4
F A Elective 1
ROTC or Elective 2
P E 1/2

151
### Junior Year

#### First Semester
- **F A 208 or 209** 3 Hours
- **F A 265 Jewelry Design** 2 Hours
- **F A 269 Layout and Typography** 2 Hours
- **Edu 301 Teach in Sec Sch** 4 Hours
- **General Univ Requirements** 3 Hours
- **Elective** 2 Hours

#### Second Semester
- **F A 389 Art Mediums** 2 Hours
- **F A 318 Modern Art History** 3 Hours
- **Edu 401 Eval of Learning** 3 Hours
- **General Univ Requirements** 4 Hours
- **Elective** 3 Hours

### Senior Year

#### First Semester
- **Edu 405 or 406** 8 Hours
- **H Ed 480 or 481** 3 Hours
- **Edu 403 or 404** 3 Hours
- **F A 499 Special Problems** 2 Hours

#### Second Semester
- **F A 349 Printmaking** 2 Hours
- **F A 239 Oil Painting** 2 Hours
- **F A 325 Ceramics** 2 Hours
- **General Univ Requirements** 2 Hours
- **Elective** 4 Hours
- **F A Elective** 4 Hours

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

### General Art Training

#### Freshman Year

#### First Semester
- **F A 101 Introduction** 3 Hours
- **F A 105 Basic Design** 2 Hours
- **General Univ Requirements** 9 Hours
- **ROTC or Elective** 2 Hours
- **E** 1/2 Hours

#### Second Semester
- **F A 121 Drawing** 2 Hours
- **General Univ Requirements** 9 Hours
- **F A Elective** 3 Hours
- **ROTC or Elective** 2 Hours
- **E** 1/2 Hours

### Sophomore Year

#### First Semester
- **F A 123 Figure Drawing** 2 Hours
- **F A 129 Volume Design** 2 Hours
- **General Univ Requirements** 6 Hours
- **Elective** 4 Hours
- **ROTC or Elective** 2 Hours
- **E** 1/2 Hours

#### Second Semester
- **F A 222 or 230** 2 Hours
- **General Univ Requirements** 6 Hours
- **Elective** 6 Hours
- **ROTC or Elective** 2 Hours
- **E** 1/2 Hours

### Junior Year

#### First Semester
- **F A 208 or 209** 3 Hours
- **F A 255 or 259** 2 Hours
- **Phil 101 Introduction** 3 Hours
- **General Univ Requirements** 6 Hours
- **F A Elective** 2 Hours

#### Second Semester
- **F A 152 Lettering** 1 Hour
- **F A 325 Ceramics** 2 Hours
- **F A 356 or 360** 2 Hours
- **General Univ Requirements** 3 Hours
- **F A Elective** 4 Hours
- **Elective** 4 Hours

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

### Transfer Students

Students who have taken basic art courses and who transfer to fine arts at Washington State University at the beginning of the sophomore year may elect to graduate under the professional art training program. Those students who have had little training in art and transfer at the beginning of the junior year are advised to graduate under the general art program.

### Preparation for Graduate Study

Undergraduates who wish to prepare for graduate study leading to the degree of Master of Arts in the Teaching of Fine Arts should take a minimum of 30 hours of undergraduate work in art; those who wish to pursue study for the Master of Fine Arts should have an undergraduate major of 40 or more semester hours, including drawing, figure drawing, painting, sculpture, and art history.
Program in Food Science

Professor and Chairman of the Program, T. L. Forster; Professors, U. S. Ashworth, Margaret Hard, Marion Jacobson; Associate Professors, L. O. Lueddeke, L. J. Manus, C. W. Nagel, M. J. Powers, Genevieve E. Scheier, J. V. Spencer; Assistant Professor, C. A. Pettibone.

An undergraduate curriculum in Food Science is offered jointly by the Departments of Animal Sciences and Horticulture. Students should refer to the catalog listing of these departments for the undergraduate schedule of studies. There are also undergraduate offerings in the Food Science area by the Department of Foods, Nutrition, and Institution Management. Undergraduate students should confer with a representative of one of these departments for further guidance.

Programs of study leading to advanced degrees may be developed through the interdepartmental committee of the Food Science staff. Participating departments are Agricultural Engineering, Animal Sciences, Foods, Nutrition, and Institution Management, and Horticulture. The student chooses one of the participating departments in which to do his research and thesis. Additional course work in the other participating departments will depend on the individual's academic preparation and interest. Minors may be taken in chemistry, bacteriology, botany, zoology, or in a field of engineering or economics.

Description of Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>170</td>
<td>Introduction to Food Industries</td>
<td>2</td>
<td>Same as A S 170.</td>
</tr>
<tr>
<td>270</td>
<td>Food Selection and Appraisal</td>
<td>2</td>
<td>Same as A S 270.</td>
</tr>
<tr>
<td>370</td>
<td>Food Chemistry</td>
<td>(3-3)</td>
<td>Same as A S 370.</td>
</tr>
<tr>
<td>371</td>
<td>Food Analysis</td>
<td>(2-6)</td>
<td>Same as A S 371.</td>
</tr>
<tr>
<td>403</td>
<td>Agricultural Processing</td>
<td>(2-3)</td>
<td>II Pre-req Ag M 210 or Math 107; Phys 101. Principles of steam, refrigeration, heat transfer, and materials handling as applied to agricultural product processing and storage.</td>
</tr>
<tr>
<td>416</td>
<td>Microbiology of Food</td>
<td>(2-3)</td>
<td>Same as Bact 416.</td>
</tr>
<tr>
<td>420</td>
<td>Comparative Foods</td>
<td>2</td>
<td>Same as FNIM 420.</td>
</tr>
<tr>
<td>421</td>
<td>Comparative Foods Laboratory</td>
<td>1 (0-3)</td>
<td>Same as FNIM 421.</td>
</tr>
</tbody>
</table>

Department of Foods, Nutrition, and Institution Management

Associate Professor and Chairman of Department, Delight Mangban; Professors, Margaret Hard, Marion Jacobson; Associate Professors, Genevieve Scheier, Grace Sweat, Ellen Watson; Assistant Professors, Gladys Kidd, Madeleine Mitchell; Instructors, Samuel Huff, Elizabeth Kaiser, Frances Maier, Genevieve McDonald, Ellen McDonough.

This course is designed to prepare students for professional dietetics, positions as home economists in food-related organizations, and for research and graduate study.

The Dietetics Option is designed to provide students with a background for professional dietetics. Graduates are eligible for entrance into hospital, administrative, or clinic internships approved by the American Dietetic A-
430 Human Nutrition 3 I Prereq Biochem or c/; Zool 251. Food related to human nutrition; factors influencing the body's requirements for food.


435 Diet Therapy 3 (2-3) II Prereq FNIM 430. Nutrition principles applied to pathological conditions in man.

438 Readings in Nutrition 2 II Prereq FNIM 430. Reports, discussions, and reviews of recent scientific literature.

521 Research Techniques in Nutrition 3 (1-6) II 1971-72 a/y. Prereq 4 hrs Bact; Chem 217, 364; 3 hrs nutrition; statistics recommended. Chemical and microbiological methods of nutrient assay; animal and human balance studies.

### Household Equipment

**FNIM**

266 Household Equipment 3 (2-3) Prereq sophomore standing. Electricity in the home; selection, operation, and care of equipment.

268 Electricity and Lighting in the Home 3 (2-3)

460 Demonstration 3 (1-6) Prereq 12 hrs H E courses. Techniques; planning and producing demonstrations for business, teaching, or television.

### Institution Management

**FNIM**

280 Quantity Food Preparation 5 (3-6) Prereq FNIM 120 or 121; 130. Principles of food preparation, nutrition, and management applied to the production and service of food in quantity.

381 Institution Food Purchasing 4 (3-3) II Prereq FNIM 280. Producing areas, distribution of food products, specifications, storage, and practices in quantity buying.

382 Institution Equipment 3 I Prereq FNIM 280. Materials, methods of manufacture, operation, installation, cost, and use of equipment; equipment layouts.

480 Institution Organization and Administration 3 I Prereq FNIM 280. Organization and problems of administration as applied to housing and feeding of large groups.

483 (482) Readings in Institution Management 2 II Prereq B A 230; FNIM 381, 480. Reports, discussions, and reviews of recent scientific literature in food service management.

580 Present Developments in Organization and Administration in Institutions 3 II Prereq FNIM 481. Advanced administrative problems, procedures, personnel management, and on-the-job training.

Problems, Research, and Thesis

FNIM

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

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

600 Research, Thesis, or Examination Variable credit.

Departmental Requirements

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

All students in the department are required to take the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Engl Comp Elective</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105, 106</td>
<td>8</td>
</tr>
<tr>
<td>Chem 240 Organic</td>
<td>4</td>
</tr>
<tr>
<td>Anth 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Bact 101 Elementary</td>
<td>4</td>
</tr>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>C T 107 Design Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
<td>4</td>
</tr>
<tr>
<td>CFS 247 Family Relationships</td>
<td>3</td>
</tr>
<tr>
<td>CFS 350 Family Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>Zool 251 Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>FNIM 121 Food Preparation</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 130 Nutrition for Man</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 280 Quantity Food Prep</td>
<td>5</td>
</tr>
<tr>
<td>FNIM 334 Family Food Mgt</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 381 Inst Food Purchasing</td>
<td>4</td>
</tr>
</tbody>
</table>

Dietetics Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Educ 201 Human Development</td>
<td>4</td>
</tr>
<tr>
<td>B A 230 Accounting</td>
<td>4</td>
</tr>
<tr>
<td>B A 350 or Psych 306</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 382 Inst Equipment</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 430 Human Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 480 Inst Org and Administration</td>
<td>4</td>
</tr>
</tbody>
</table>

Students who plan a hospital or clinic internship should elect FNIM 435; those planning an administrative internship should elect FNIM 420, 421.

Food-Related Business Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spe 112 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 266 or 382</td>
<td>3</td>
</tr>
<tr>
<td>B A 350 or Psych 306</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 420, 421</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 422 Food Quality Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 460 Demonstration</td>
<td>3</td>
</tr>
</tbody>
</table>

Research Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Chem 217 Quant Analysis</td>
<td>4</td>
</tr>
<tr>
<td>Chem 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>FNIM 420, 421</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 430 Human Nutrition</td>
<td>3</td>
</tr>
</tbody>
</table>

Transfer Students

Transfer not later than the second semester of the sophomore year is recommended to allow scheduling of major courses in proper sequence.

Preparation for Graduate Study

Normally the applicant should have an undergraduate major in foods, nutrition, or institution 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.
Department of Foreign Languages

Professor and Chairman of the Department,  
A. O. Lindberg; Professors, R. B. Knox, I. L.  
Kosin, A. P. Stabler; Associate Professors, A.  
Cantera, R. G. Kappler, Elizabeth Lord, W. A.  
Luchtling, Antoinette Poulsen, J. C. Seigneuret,  
B. Weaver; Assistant Professors, R. L. Beamish,  
D. P. Benseler, J. T. Brewer, P. R. Brown, E. Hartman, C. J. Kenlan, H. C. Kim,  
Gertrud S. Mazur, Marianna Ogles, L. Shepard.

The Department of Foreign Languages offers courses in French, German, Spanish, Latin, Russian, and Swedish. The elementary courses have been planned to meet the needs of those who have begun the study of language in high school as well as those who undertake the study for the first time in college.

The courses in this department are intended to serve several purposes: (1) to enable the student to gain proficiency in French, German, Russian, and Spanish and to acquire a knowledge and appreciation of the respective literatures and cultures; (2) to prepare future teachers of French, German, Latin, Russian, and Spanish; (3) to contribute to the general education of students by giving them opportunity to study foreign languages, literatures, and civilizations; (4) to give language training for careers which require it, such as diplomatic service and other government positions, foreign commerce, and library work; and (5) to enable students in other departments to read foreign publications in their fields of interest.

A modern language laboratory with facilities for listening, oral practice, and recording is used to supplement regular class work and is available to the individual student ample opportunity to develop active use of the language.

Modern language clubs and small conversational groups, affording excellent training in conversation and literary appreciation, are organized and conducted under the supervision of the department.

The department has the responsibility for administering foreign language examinations to some candidates for advanced degrees.

The department offers courses of study leading to the degrees of Bachelor of Arts in Foreign Languages, Master of Arts in Foreign Languages, and Doctor of Philosophy (Literary Studies).

Description of Courses

For explanation see Index under "Symbols"

Foreign Language

For L

324 Methods of Teaching Foreign Languages 2 Prereq 2 yrs Fren, Ger, Lat, Rus, or Span.

325 Methods of Teaching Foreign Languages 2 Same as For L 324.

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

591 Seminar in Literary Studies 3 Same as Engl 591.

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

600 Research, Thesis, or Examination Variable credit.

French

Fren

051 Essentials of French No credit. For graduate students preparing for foreign language examinations.

101 First Semester French 4

102 Second Semester French 4 Prereq Fren 101.

198 French Honors 4 I

199 [H] French Honors 4 II Prereq Fren 198.


204 [H] Fourth Semester French 4 Prereq Fren 199 or 203.

220 [H] French Civilization—Early Period 2 1 Open to all students. Lectures and readings in English on the cultural history of France from ancient times to the death of Louis XIV.

221 [H] French Civilization—Modern Period 2 II Lectures and readings in English on the cultural history of France from the beginning of the Age of Enlightenment to modern times.

311 Pronunciation and Phonetics 3 Prereq Fren 203. Problems of French phonetics and pronunciation.

320 French Laboratory I 1 (0-3) Prereq Fren 204.

321 French Laboratory II 1 (0-3) Prereq Fren 204.

322 Composition and Conversation 3 Prereq Fren 204.

333 [H] Survey of French Literature to 1700 3 Prereq Fren 204. French literature from the origins to 1700.

334 [H] Survey of French Literature after 1700 3 Prereq Fren 204.
421 [H] French Literature of the Seventeenth Century 3 Prereq Fren 204.
432 [H] French Literature of the Eighteenth Century 3 Prereq Fren 204.
441 [H] French Literature of the Nineteenth Century 3 Prereq Fren 204.
442 [H] French Literature of the Nineteenth Century 3 Prereq Fren 204.
480 Seminar in French Language or Literature 3 May be repeated for credit. Prereq Fren 204.
499 Special Problems 1-4 May be repeated for credit.
501 Medieval French Literature 3 I 1970-71 a/y. Medieval authors and genres; introduction to the development of the French language.
580 Graduate Seminar 3 May be repeated for credit.
599 Special Problems 1-4 May be repeated for credit.

German

Ger

051 Essentials of German No credit. For graduate students preparing for foreign language examinations.
101 First Semester German 4
102 Second Semester German 4 Prereq Ger 101.
198 German Honors 4 I
199 [H] German Honors 4 II Prereq Ger 198.
203 [H] Third Semester German 4 Prereq Ger 102.
204 [H] Fourth Semester German 4 Prereq Ger 199 or 203.
220 [H] Germanic Civilization—Early Period 2 I Open to all students. Germanic culture taught in English with readings and lectures in English.
221 [H] Germanic Civilization—Modern Period 2 II Open to all students. Germanic culture taught in English with readings and lectures in English.
320 German Laboratory I 1 (0-3) Prereq Ger 204.
321 German Laboratory II 1 (0-3) Prereq Ger 204.

Composition and Conversation 3 Prereq Ger 204.
333 [H] Introduction to German Literature 3 Prereq Ger 204. Transitional course shifting emphasis from language as such to literature.
334 [H] The German Novelle 3 Prereq Ger 204. Transitional course shifting emphasis from language as such to the study of one literary genre.
432 [H] German Literature of the Eighteenth Century 3 Prereq Ger 204. Lessing and Schiller.
440 Goethe 3 Prereq Ger 204.
442 [H] German Poetry and Drama of the Nineteenth Century 3 Prereq Ger 204.
451 German Literature from 1880 to the First World War 3 Prereq Ger 204.
452 German Literature from the First World War to the Present 3 Prereq Ger 204.
460 German Poetry 3 Prereq Ger 204. Introduction to German poetry through a study of Germanic lyrics and ballads.
461 German Literature to 1700 3 Prereq Ger 204.
480 Seminar in German Language or Literature 3 May be repeated for credit. Prereq Ger 204.
499 Special Problems 1-4 May be repeated for credit.
543 German Romantic Movement 3 I 1970-71 a/y. Literary, aesthetic, and philosophic writings of the Romantic period.
599 Special Problems 1-4 May be repeated for credit.

Latin

Lat

101 Beginning Latin 4 I 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 II Prereq Lat 101.
299 Readings and Conferences 1-4 May be repeated for credit. Prereq Lat 102.

Russian

Rus

101 First Semester Russian 4 I
102 Second Semester Russian 4 II Prereq Rus 101.
204 [H] Fourth Semester Russian 4 II Prereq Rus 203.
UNE CHARGE.
230 [H] Introduction to Slavic Studies 3
Slavic cultures taught in English with
readings and lectures in English.
320 Russian Laboratory I 1 (0-3) Prereq
Rus 204. Laboratory practice to im-
prove aural-oral skills and perfect pro-
nunciation.
321 Russian Laboratory II 1 (0-3) Prereq
Rus 204.
Prereq Rus 204. Word derivation and
formation; the syntax of the noun, ad-
djective, and preposition.
331 Advanced Grammar II 3 I 1971-72 a/y.
Prereq Rus 204. Syntax of the verbs,
adverbs, and conjunctions; the ele-
ments of simple and compound sentences.
411 [H] Early Russian Literature 2 Prereq
Rus 204. Reading and study of prin-
cipal literary monuments of Russia from
earliest times to 1825.
441 Russian Literature of the Nineteenth
Century 3 Prereq Rus 204.
451 Russian Literature of the Twentieth
Century 3 Prereq Rus 204. Pre-Soviet
period.
471 Russian Literature of the Soviet Period
3 Prereq Rus 204. Representative exam-
pies of Russian prose written in the
USSR after 1920.
499 Special Problems 1-4 May be repeated
for credit.
599 Special Problems 1-4 May be repeated
for credit.

Spanish
Span
101 First Semester Spanish 4
102 Second Semester Spanish 4 Prereq Span
101.
203 [H] Third Semester Spanish 4 Prereq
Span 102.
204 [H] Fourth Semester Spanish 4 Prereq
Span 203.
220 [H] Hispanic Civilization 3 Open to
all students. Spanish culture with lec-
tures and readings in English.
221 [H] Hispanic American Culture 2
Spanish-American culture with lectures
and readings in English.
320 Spanish Laboratory I 1 (0-3) Prereq
Span 204.
321 Spanish Laboratory II 1 (0-3) Prereq
Span 204.
322 Composition and Conversation 3 Pre-
req Span 204.
333 [H] The Generation of 1898 and Mod-
ernism 3 Prereq Span 204. An intro-
ductive course in Spanish literature.
334 [H] Nineteenth Century Spanish
American Literature 3 I Prereq Span
204. Selected readings from independ-
ence to modernism.
421 Golden Age Literature 3 I 1970-71 a/y.
Prereq Span 204. Poetry and prose of
the Spanish Golden Age.
422 [H] Drama of the Golden Age 3 I
1971-72 a/y. Prereq Span 204. Spanish
drama of the Golden Age.
441 Spanish Prose of the Nineteenth Cen-
tury 3 Prereq Span 204.
442 Spanish Drama and Poetry of the
Nineteenth Century 3 Prereq Span 204.
451 Spanish Literature of the Twentieth Cen-
tury 3 Prereq Span 204.
472 [H] Spanish-American Literature Since
1888 3 Prereq Span 204.
474 Spanish-American Novel 3 Prereq Span
204. Argentina and Chile.
480 Seminar in Spanish Language or Lit-
erature 3 May be repeated for credit.
Prereq Span 204.
499 Special Problems 1-4 May be repeated
for credit.
501 Medieval Spanish Literature 3 I 1971-
72 a/y. Readings in important works
of medieval Spanish literature; linguis-
tic problems of Old Spanish.
573 (473) Spanish-American Novel 3 Pre-
req Span 204. Mexico and the Andean
countries.
599 Special Problems 1-4 May be repeated
for credit.

Swedish
Swed
102 Second Semester Swedish 4 II 1970-71
a/y. Prereq Swed 101.

Schedule of Studies

At least 30 of the total hours required for
the bachelor's degree in this program must be
in upper-division courses.

Before undertaking this schedule of studies,
a student should complete Engl 101 and two
semesters of one language (Fren, Ger, Rus, or
Span). Those who are not certified to the
department until the end of the sophomore
year should have completed four semesters of
the major language and in the case of Ger-
man and Spanish majors, the corresponding
civilization course. They should also have
completed 8 hours of a second foreign lan-
guage, and they must have completed three-
fourths of the General University Require-
ments for Graduation.
In the junior and senior years the student may take from 2 to 8 hours of a foreign language each semester, making sure that he has a total of at least 20 hours for the two years.

A minimum of 34 hours (excluding 101) or the equivalent in competence in the major language and a minor in a second language (8 hours beyond 102) or, with the approval of the student's adviser and the departmental chairman, a corresponding minor in another appropriate field, is required for a Bachelor of Arts degree in Foreign Languages.

**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fren 333, Ger 220, or Span 220</td>
<td>2-3</td>
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<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
<td>6</td>
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<tr>
<td>Minor Language or other minor</td>
<td>3-4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
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<tr>
<td>Elective</td>
<td>8</td>
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<tr>
<td>Minor Language or other minor</td>
<td>3-4</td>
</tr>
<tr>
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</tr>
<tr>
<td>P E</td>
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</table>

**Junior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
<td>3-6</td>
</tr>
<tr>
<td>Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>Minor Language or other minor</td>
<td>3-4</td>
</tr>
<tr>
<td>Rus 330 or 331 (Rus majors)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fren 322 or 311 (Fren majors); Ger or Span 322 (Ger or Span majors)</td>
<td>3</td>
</tr>
<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
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</tr>
<tr>
<td>Elective</td>
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<tr>
<td>Minor Language or other minor</td>
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**Senior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
<td>3-6</td>
</tr>
<tr>
<td>Elective</td>
<td>10-11</td>
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</table>

<table>
<thead>
<tr>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fren, Ger, Rus, or Span Elective</td>
<td>3-6</td>
</tr>
<tr>
<td>Elective</td>
<td>10-11</td>
</tr>
</tbody>
</table>

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

**Teacher-Training Preparation**

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.

**Preparation for Graduate Study**

Students with undergraduate majors in such subjects as the classics, English, history, and philosophy, as well as in foreign languages, may be well prepared for graduate study in this department.

Undergraduate students pursuing their studies at other institutions or through other curricula at this institution who contemplate graduate work in the department will do well to elect courses similar to those required in the above schedule of studies.

**Area Studies**

The program in area studies permits students interested in a particular region of the world to follow a curriculum that concentrates on the language, history, politics, geography, economics, and general culture of that area. In combination with office administration, such a program leads to a career in work abroad. Through careful choice of electives and of courses meeting General University Requirements, a student may obtain sufficient concentration to prepare for graduate study in any one of several of the specialized fields in the area studies curriculum. For those who have the broad training of an undergraduate program in area studies supplemented by a specialized graduate program, a wide variety of careers is available in international affairs at home and abroad.

Students intending to work toward a graduate degree in foreign languages should ordinarily not choose the area studies option.

**Schedule of Studies**

A student who wishes to undertake the area studies program should plan his first two years to include:

1. Completion of the General University Requirements insofar as possible.
2. Four semesters of the foreign language appropriate to the area in which he wishes to specialize.
3. Hist 101 and 102 for those interested in Eastern and Western Europe, Hist 240 and 241 for those interested in Latin America.

It is highly desirable that the student meet the General University Requirements from the following courses: Anth 101 or Soc 101; Econ 102 or 201; 203; Geog 102; Hist 120; 121; Pol S 101; and at least 6 hours in Engl or American literature, Phil or Hum 101, 102.
Latin American Studies
Courses required in the junior and senior years: Anth 351, 455; Econ 320, 470, 472; Geog 323; Hist 413, 419; Pol S 222, 413, 414, 423, 427, 438; Soc 480; Span 221, 322, 6 hours of Spanish-American literature; 12 hours of electives.

Western European Studies
Courses required in the junior and senior years: Anth 455; Econ 320, 470, 472; Fren or Ger 220, 322, 6 hours of French or German literature; Geog 331; Hist 406; Pol S 222, 330, 411, 423, 427, 438; Soc 480; 12 hours of electives.

Eastern European Studies
Courses required in the junior and senior years: Anth 455; Econ 320, 470, 472; Geog 332; Hist 410, 411; Pol S 222, 411, 412, 423, 427, 438; Rus 320, 330, 6 hours of Russian literature; Soc 480; 12 hours of electives.

Department of Forestry and Range Management


The department is fully accredited by the Society of American Foresters and the Range Management Education Council.

Bachelor’s Program
The undergraduate program is intended to accomplish three objectives for each student:
1. Provide the breadth of education to prepare him for a fruitful adult life as a responsible citizen.
2. Provide the basic technical and professional education needed to begin a career in some branch of wildland management.
3. Identify his potential interests in a specialized area of his professional field which may lead to further graduate study or job specialization.

The first objective is achieved by the selection of elective courses in social sciences and humanities.

The second objective is achieved by successful completion of a core of basic science and technical courses.

The third objective is achieved through careful selection of elective courses which help the student to explore his special interests and aptitudes. The options may involve areas such as forest management, forest science, forest business, soils, wildland management, forest recreation, and others.

Summer Field Experience—
Professional Integration
Between the junior and senior years, all students work for a minimum period of eight weeks in a program under the direction of professional foresters or range managers.

Students will enroll in the summer session course, For 399, Professional Integration, and carry out, under the direction of a faculty advisor, a program of studies and readings designed to integrate formal course work with professional field experience. The department assists in obtaining suitable employment for this requirement.

Opportunities for Employment
Students and graduates find opportunities for summer and permanent employment in a wide variety of resource management agencies with consultant, industrial, municipal, state, and federal employers.

The department offers courses of study leading to the degrees of Bachelor of Science in Forest Management, Bachelor of Science in Range Management, Master of Science in Forestry, and Master of Science in Range Management.

Description of Courses
For explanation see Index under "Symbols"

110 Forestry Orientation 1 I Forest resources and the profession of forestry. Primarily for forestry freshmen.

Culture
For

301 Forest and Range Environments 3 Prereq Bio S 103. Site factors and their effect on forest and range vegetation.

302 Silviculture 3 Prereq For 301. Treatment and regeneration of the forest.

402 Forestation 3 (2-3) II Prereq For 301. Forest seed, nursery, planting, and seedling problems.
Advanced Topics in Silviculture 2 May be repeated for credit. II Prereq For 302. Directed library research in areas of special silvicultural interest.

Range Regeneration 3 (2-3) II 1970-71 a/y. Prereq For 301; Bot 460. Ecological factors controlling seedling establishment; methods of manipulating factors of the environment to improve probability of success.

Economics

Forest Economics 3 I Prereq Econ 201. Economic analysis applied to problems in the utilization of forest land and forest products.

Forest Finance and Valuation 3 II Prereq For 311. Economic and fi-nance principles applied to forest management and appraisals.

Advanced Forest Economics 3 I 1971-72 a/y. Prereq For 311; Econ 301. Literature relating economic principles to forest management, utilization, and marketing.

Ecological and Use

Dendrology 3 (2-3) I Classification and identification of forest trees.

Range Forage Plants 3 (1-6) II Prereq Bot 232. Range grasses, forbs, browse, and poisonous plants; their identification, distribution, ecology and management, with notes on economic and nutritive value.

Measurement

Principles of Forest Measurements 3 (2-3) II Measurement of timber in the log, tree, and stand.

Forest Measurement 2 II Prereq Biom 310; For 212. Theory of forest measurements, growth and yield of trees and stands, and continuous forest inventory techniques.

Air Photo Interpretation 2 (0-6) II Same as Soils 416.

Range Analysis 3 (2-3) I Prereq Biom 310; For 334. Methods, techniques, and terminology applicable to the measurement of range forage production and utilization. Field trip required.

Protection

Forest Fire 2 I Causes, behavior, and effects of forest fires; techniques of prevention, presuppression and suppression; uses of fire in wildland management.

Conservation of Renewable Resources 3 Philosophy and principles of conservation; identification of major uses of the resources; case studies to illustrate conservation practices.

Forest Pathology 3 (1-6) Same as Pl P 331.

Forest Entomology 3 (2-3) I Principles and concepts of forest entomology; integration and application of basic knowledge; processes in dealing with forest insect problems.

Advanced Forest Pathology 1 I 1970-71 a/y. Prereq Pl P 329, 331. Recent literature of forest pathology.

Advanced Forest Entomology 2 II 1971-72 a/y. Prereq Biom 310 or 412; For 348 or Entom 441. Ecological interrelationships between insects and trees; experimental methods in forest entomology.

Management

Principles of Range Management 3 I Introduction, history, regions, physiological and ecological applications, measurements, interpretations, and planning.

Range Livestock Management 3 II Prereq For 351. Description, distribution, interrelationships, and management of rangeland animals.

Forest and Range Policy and Administration 3 I Prereq senior standing. Forest laws and policies; organization and administration of public and private forest enterprises; administration of special and multiple uses.

Timber Management 3 I Prereq For 302, 312, 411. Regulation of forests for sustained yield; decision making problems and techniques in the management of forests for timber production.

Advanced Range Management 3 (2-3) II Prereq For 351, 451. Applications of recent developments and research to the planning and administration of rangeland.
Watershed Management 3 I Prereq senior standing. Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values.

Forest Recreation 3 II Prereq senior standing. Principles of recreation service; problems of developing recreation benefits on forest lands managed for multiple uses.

Multiple Use Management 3 I Prereq senior in forestry. Integration of multiple uses of forest and rangelands through application of modern technological, social, and mathematical principles.

Range Plant Communities 3 (2-3) I Prereq For 452, Soils 201. Description and manipulation of major plant communities under various conditions of grazing stress.

Utilization

For

Timber Harvesting 3 II Current practices and problems; planning and coordinating timber harvesting with forest management.

Wood Structure and Properties 3 (2-3) I Prereq Bio S 103. Wood anatomy; identification and uses of commercial U.S. species; properties, defects, and variation; relation of structure and properties to utilization.

Forest Products 3 II Prereq For 321. Production methods, grading and utilization of primary, secondary, and chemically derived wood products; wood preservation.

Physical properties of wood: density, moisture relations, mechanical, thermal, electrical; technology of seasoning, adhesion, and finishing.

Problems, Seminar, Research and Thesis

For

Forest and Range Management Seminar 1 May be repeated for credit.

Land Use Seminar 1 I 1971-72 a/y. Prereq junior standing. Literature and current policies of multiple-use management.

Special Problems 1-4 May be repeated for credit.

Seminar in Forestry and Range Management 1 May be repeated for credit. Literature review; preparation and presentation of reports in forestry and range science.

Special Problems 1-4 May be repeated for credit.

Research, Thesis, or Examination Variable credit.

Schedule of Studies

General Forestry

The following schedule of studies meets professional standards established by the Society of American Foresters and the Civil Service Commission.

At least 50 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>Hours</th>
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<tbody>
<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Bio S 103 Introductory</td>
</tr>
<tr>
<td>For 110 Orientation</td>
</tr>
<tr>
<td>Math 107 Precalculus</td>
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<tr>
<td>Chem 105 Principles</td>
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<tr>
<td>ROTC or Elective</td>
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Second Semester

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<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Speech 112 Fundamentals</td>
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<tr>
<td>Bio S 104 Introductory</td>
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<tr>
<td>Chem 106 Principles</td>
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<tr>
<td>Math 171 Calculus</td>
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Sophomore Year

First Semester

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<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>For 201 Dendrology</td>
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<tr>
<td>For 230 Forest Fire</td>
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<tr>
<td>Phys 101 General</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td>C E 101 Intro to Survey</td>
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<tr>
<td>ROTC or Elective</td>
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Second Semester

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Geol 101 Introduction</td>
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<tr>
<td>For 212 Forest Measurements</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td>Elective</td>
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<tr>
<td>ROTC or Elective</td>
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</table>

Junior Year

First Semester

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>For 301 Environments</td>
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<tr>
<td>For 348 Forest Entom</td>
</tr>
<tr>
<td>For 311 Economics</td>
</tr>
<tr>
<td>Biom 310 Ag Statistics</td>
</tr>
<tr>
<td>Utilization Elective</td>
</tr>
</tbody>
</table>
second Semester  Hours
oils 201 Soils  3
oils 416 Air Photo Interp  2
or 302 Silviculture  3
or 312 Mensuration  2
or 331 Forest Path  3
or 411 Finance and Valuation  3
summer Session  Hours
or 399 Professional Integration  2

Senior Year  Hours
first Semester
or 412 Policy and Administration  3
or 415 Timber Mgt  3
Management Electives  6
Elective  1
second Semester  Hours
Management Elective  3
Elective  10
Courses printed in Roman type are required or graduation, in italics are optional.

Areas of Specialization
A consultation with the adviser, the general forestry schedule of studies may be modified to provide areas of specialization in business, physical science, or biological science.

Range Management
The following schedule of studies meets professional standards established by the Range Management Education Council and Civil Service Commission.
At least 48 of the total hours required for the bachelor's degree in this program must be upper-division courses.

Freshman Year  Hours
first Semester
Engl 101 Composition  3
Bio S 103 Introductory  4
Math 107 PreCalculus  3
or 110 Orientation  1
ROTC or Elective  2
E  1/2
second Semester  Hours
Comp, Engl, or Spe Elective  3
Bio S 104 Introductory  4
Then 105 Principles  4
Hum or Soc S Elective  3
ROTC or Elective  2
E  1/2

Sophomore Year  Hours
first Semester
A S 101 An Sciences  3
Chem 106 Principles  4
Geol 101 Introductory  4
Spe 112 Fundamentals  3
ROTC or Elective  2
E  1/2
second Semester  Hours
Chem 240 Organic  4
For 301 Environments  3
Bot 232 Systematic  3
Soils 201 Soils  3
ROTC or Elective  2
E  1/2

Junior Year  Hours
first Semester
Bot 320 Plant Physiology  3
Zool 435 Wildlife Ecology  3
For 351 Range Management  3
Econ 201 Principles  4
A S 200 Nutrition  3
second Semester  Hours
For 354 Range Forage Plants  3
For 352 Range Livestock Mgt  3
Biom 310 Ag Statistics  3
For 302 Silviculture  3
Soils 416 Air Photo Interp  2
Elective  2-3
summer Session  Hours
For 399 Professional Integration  2

Senior Year  Hours
first Semester
Bot 462 Syneology  3
Bot 436 Agrostology  3
For 451 Range Analysis  3
For 460 Watershed Management  3
For 493 Land Use Seminar  1
A S 340 Farm Mgt  3
second Semester  Hours
For 452 Ad Range Mgt  3
Hum or Soc S Elective  3
Elective  10
Courses printed in Roman type are required for graduation, in italics are optional.

Transfer Students
Transfer students should plan to complete the basic courses in English, chemistry, biology, mathematics, and speech by the end of their sophomore year.

Graduate Programs
Students wishing to develop their skills beyond the four-year program and having strong performance records in undergraduate work may elect to enroll in graduate programs. These programs are developed to lead to a Master of Science degree in either Forestry or in Range Management.
The two principal functions of this program are the listing of courses that are of general interest to students in agriculture and related fields and the administration of the major in general agriculture.

The major is designed for students who wish to prepare for certain careers requiring a broad training in agriculture, such as farming and ranching, cooperative extension, and private and public services in agriculture. A maximum number of electives is permitted to enable the student to do some specializing in one or two fields, or otherwise to tailor the curriculum to fit his particular needs.

The courses of study lead to the degrees of Bachelor of Science in Agriculture and Master of Extension.

Description of Courses

For explanation see Index under "Symbols"

Agriculture

Ag
101 Introduction to Agriculture 2 Survey of the broad field of agriculture, its relation to society, government, and business.
205 Human Relations in the Business of Agriculture 3 (2-3) Prereq Engl 101, Spe 101, or 112. Developing understanding of human behavior and skills in communication and leadership.
499 Special Problems 1-4 May be repeated for credit.

Agricultural Extension

Ag Ex
301 Introduction to Agricultural Extension 2 I History, objectives, organization, opportunities, and principles of work.
401 Methods in Agricultural Extension 3 (2-3) II Prereq Ag Ex 301. Methods and procedures in carrying on an educational program with rural people.
510 Development and Evaluation of Cooperative Extension Programs 3 (2-3) II Techniques and methods used in developing, implementing, and evaluating programs with rural people.

Biometrics

Biom
310 Agricultural Statistics 3 (2-2) Prereq Math 101c or equivalent. Methods of statistical analysis and the principles involved in their interpretation and application to agricultural data.
412 Biometry 3 I Prereq Math 201 recommended. Principles and methods of statistical analysis as applied to biological experimentation.
512 Experimental Design 3 II Prereq Biom 412. Principles with analysis and interpretation of data.

Schedule of Studies

Students electing a major in General Agriculture must complete at least 12 semester hours in English composition, speech, and communications, 3 in mathematics, 3 in statistics, 16 in physical and biological sciences, 16 in social sciences and humanities. The student must have at least 46 semester hours in agriculture. The student must have at least 4 courses in one department and 3 courses in a second department within the College of Agriculture. At least 18 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>Ag 101 Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 101c, 102, or 201</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
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<tr>
<td>P E</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101 or 105</td>
<td>4</td>
</tr>
<tr>
<td>Com, Spe, or Engl Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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</tbody>
</table>
Sophomore Year

First Semester
- Chem 102 or 106
- Bio S 103 Introductory
- Spe 112 Fundamentals
- Econ 102 Fundamentals
- ROTC or Elective
- P E

Second Semester
- Bio S 104 or Bot 201
- Hum or Soc S Elective
- Ag 205 or Spec, Engl, Com Elective
- Econ 203 Fundamentals
- ROTC or Elective
- P E

Junior Year

First Semester
- Entom 343 or PL P 329
- Ag Ec Elective
- A S 200 Nutrition
- Elective

Second Semester
- Soils 201 Soils
- Hum or Soc S Elective
- Elective

Senior Year

First Semester
- Ag M 344 Irrigation and Drainage
- Agron 303 Weeds
- Entom 343 or PL P 329
- Elective

Second Semester
- Soils 301 Soil Management
- Elective

General Studies

H. E. Brewer, Coordinator: Biological Science, Physical Sciences, Mathematics; J. D. Lillywhite, Coordinator: Humanities, Social Sciences; J. Goss, Adviser: Linguistics.

General Studies is for those who want a more diversified program than is offered within the framework of a single major department. The intent is to provide for a liberal arts education, with or without a particular vocational focus. The student earns a Bachelor of Arts or Bachelor of Science degree that is not identified with a specific field.

Students who choose General Studies should complete the General University Requirements for Graduation and the special requirements of the College of Sciences and Arts by the end of the junior year. (See General University Requirements section of this catalog.)

Students who wish to enroll in General Studies after the beginning of the senior year must obtain special permission through the appropriate coordinator.

Total credits earned for the bachelor's degree must include a minimum of 30 hours in courses at the 300- and 400-level.

Option I. Departmental Concentration

A minimum of 24 hours (including 15 at the 300- and 400-level) in a single department or program within one of the four broad areas of concentration specified below, and at least 15 hours (including 6 at the 300- and 400-level) in a different department, program, or area.

(1) Biological Sciences (bacteriology and public health; botany; environmental biology; general biology; genetics; zoology).

(2) Humanities (architecture; communications; English; fine arts; foreign languages; interior design; music; philosophy; speech).

(3) Physical Sciences & Mathematics (biochemistry; chemistry; computer science; geology; mathematics; physics).

(4) Social Sciences (anthropology; economics; geography; history; home economics; police science; political science; psychology; sociology).

Agricultural Communications

Students interested in preparing for a career in journalism or in radio and television as applied to agriculture have full opportunity to do so. The above schedule of studies will be modified and the student will be counseled jointly by General Agriculture and the Department of Communications to assure a meaningful program of courses in both areas.
Option II. Interdepartmental Concentration

A minimum of 39 hours (including 21 at the 300- and 400-level) in two or more departments or programs within one of the four broad areas of concentration specified under Option I.

Option III. Teacher-Training Concentration

Students who are preparing to teach in junior or senior high schools may in some cases receive their degrees in the General Studies program. 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 or the Provisional Certificate. The degree awarded is Bachelor of Arts or Bachelor of Science, according to the degree granted in the student's major teaching field.

In case of the following teaching majors, the degree must be taken in General Studies: the junior high school major—Biological Sciences; the junior high school major—Language Arts; the junior and senior high school major—Physical Science.

In a number of junior and senior high school teaching majors the student has the choice of getting his degree in General Studies by completing additional work for a degree in the department concerned.

For further information on teaching certification, refer to the Department of Education.

Option IV. Linguistics Concentration

This option is designed to furnish a broad liberal education to those students who have an interest in and aptitude for the study of language and linguistics. Around language a core is built of literature, philosophy, mathematics, and anthropology. It enables the undergraduate to gain substantial familiarity with several languages and types of linguistic structure and to become conversant with the formal theories of linguistic analysis and the historical study of language. Such preparation will enable the student to take early cognizance of the entire field and to decide either to terminate his formal education at the level of the Bachelor of Arts, or to determine the proper direction for more advanced work.

To graduate with the option in Linguistics the student should choose among the following:

A. Mathematical Linguistics
Math 107, 171, 220, 360, or 201, 202, 360, 361 12-13
For L (above 300-level) 6
2 courses from Engl 207, 307, 454 6
3 courses from Anth 450, 451, 452, 453 9

33-34

B. Applied English Linguistics
For L (above 300-level) 6
Engl 207, 307, 308, 454, plus 3 hours 15
2 courses from Anth 450, 451, 452, 453 6
Phil 301, 315; For L (above 300-level); Math Elective 9

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C. General Linguistics
Anth 450, 451, 452, 453 12
Engl 307 or 454 3
For L (above 300-level) 6
Second For L 101-204;
Phil 301, 315; Math 107, 171, 201, 202, 220, 360, 361 15-16

37

Program in Genetics

Professor and Chairman of the Program, R. A. Nilan; Professors, W. A. Becker, A. Hecht, C. F. Konrad, M. Ounbey; Associate Professors, T. P. Boggs, R. E. Hurlbert, R. A. Littlewood, R. Moree; Assistant Professors, J. M. Hill, A. Kleinbock, L. K. Shurney.

Genetics, the science of heredity, with its different areas of specialization is involved in many branches of basic and applied biology. The program is designed to provide training in a number of areas including: molecular and developmental genetics; population and quantitative genetics; mutagenesis; cytogenetics and evolution.

The program comprises cooperating members of eleven departments of the Colleges of Agriculture and of Sciences and Arts. The
interdisciplinary role of genetics is emphasized, thus permitting students to study with geneticists who represent a wide range of research interests in plant, animal, and microbial genetics and to use the specialized equipment available in the cooperating departments.

Biochemistry, cytology, mathematics and statistics, and physiology are the principal avenues through which knowledge of genetics is acquired. These subjects are necessary supplemental areas of study for students in the program. Graduates will be prepared for careers in genetics in university-level teaching and research, for research positions with government and private agencies, and in some cases for specialized medical research.

The program offers a course of study leading to the degrees of Master of Science in Genetics and Doctor of Philosophy.

## Description of Courses

**Genet** For explanation see Index under "Symbols"


302  Genetics Lab I Prereq Genet 301 or c/.

440  Cytology and Cytogenetics I Prereq Genet 301; 1 sem Org Chem. Cell structure and chemistry in relation to heredity and development.

499  Special Problems I-4 May be repeated for credit.

501  Advanced Genetics I 3 (2-3) I Prereq Genet 301. Classical, population, and quantitative genetics.

502  Advanced Genetics II 3 (2-3) II Prereq Genet 301. Introduction to molecular, developmental, and ultrastructural genetics.

511  (501) Statistical Genetics 2 I 1970-71 a/y. Prereq Genet 301; Biom 420. Extension of basic concepts of probability and experimental statistics to the principles of genetics.


513  (503) Quantitative Genetics 2 I 1971-72 a/y. Prereq Genet 301; Biom 412. Quantitative analysis of genetic and environmental variation in populations of plants and animals; selection and correlation of quantitative traits.

535  Physiology and Genetics of Parasitism 3 II 1971-72 a/y. Same as Pl P 535.

536  Physiology and Genetics of Parasitism Lab 2 (0-6) II 1971-72 a/y. Same as Pl P 536.

540  Cytogenetics 3 (2-3) II Prereq Genet 301. Chromosomes and their relation to mechanisms of development and inheritance.


560  Molecular Genetics 3 I Prereq Genet 301, Bact 201, or Genet 502; Chem 463. Biochemical description of genetic processes in micro-organisms.


575  Research Techniques in Genetics 1 (0-3) to 3 (0-9) May be repeated for credit. Prereq Genet 501, 502. Advanced research methods and techniques.

581  (504) Advanced Topics in Genetics 1 May be repeated for credit. II Prereq Genet 501 or 502. Recent research in selected areas of genetics.

598  Seminar 1 May be repeated for credit. I Prereq Genet 301. Reviews of recent and classical researches in genetics and cytology.

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

600  Research, Thesis, or Examination Variable credit.

## Preparation for Graduate Study

A student planning graduate work should have completed a program of study equivalent to an undergraduate major in botany, microbiology, or zoology. It is recommended that such preparation shall have included a course in genetics.
FEE HOUSE
TO 12
CLOSED MONDAY

POETRY

WILLIAM DELL
author of
Benediction and
other poems

MES HOLMSTRAND

10 PM SUNDAY MAY 18

on & out coffeehouse
Geography

Professor C. R. Schroeder; Assistant Professors, K. Osbom, D. A. Stratton, G. L. Young.

Geography is the systematic and regional study of the spatial arrangement of the earth's surface and the interrelationships of the earth's physical and cultural features and of man with these features.

Courses are designed to contribute toward part of a general liberal education, partial fulfillment of requirements for teachers in the social science area, and to provide an undergraduate major in geography as preparation for graduate study or for a career in a variety of geographic or related professions.

The course of study in geography leads to the degree of Bachelor of Arts in Geography.

Description of Courses

Geog For explanation see Index under "Symbols".

101 Physical Geography 3 I Survey of the character and location of different types of landforms, climates, soils, vegetation, water resources; significance to human occupancy.

102 [S] Human Geography 3 II Cultural patterns and ecology as interrelated with landscape and natural environment.


220 Geography of the Pacific Northwest 3 Prereq sophomore standing. Terrain, climate, and resources affecting regional settlement and utilization patterns.

311 Weather and Climate 3 II The elements of weather and climate.

315 Cartography 3 (2-3) I 1970-71 a/y. Prereq Geog 102; Geog 105 or Geol 101. Principles of map construction and graphic presentation.

321 Geography of United States 3 I Dynamics of landscape change and environmental problems involved in man's occupancy and use of land in the United States.

322 Geography of Canada 3 II 1970-71 a/y. Contemporary landscape and the dynamics of geographic change in present-day Canada.

323 [S] Geography of Latin America 3 II 1970-71 a/y. Geographic regions; physical and human resources; economic and social development.

331 [S] Geography of Europe 3 I Geographic regions; physical and human resources; economic and social development.

332 Geography of the USSR 3 I Elements of the physical environment and the interrelated patterns of social and economic development of the USSR.

335 [S] Geography of Asia 3 II 1971-72 a/y. Geographic regions; physical and human resources; economic and social development.

345 Conservation of Natural Resources 3 I Economic, ecological, and social problems of resource utilization; public policies in conservation.

402 Geography as Human Ecology 3 II 1971-72 a/y. Western technological man and his environment; increasing technology and man's increasing dominance of nature.

403 Human Ecology in Non-Western Settings 3 I 1970-71 a/y. Environmental perceptions; man-land relationships; exploitation, destruction, and conservation; agricultural origin, dispersals, and systems; environment and economic development.

445 Urban Geography 3 II Prereq Geog 102 or 105. Geographical-ecological examination of development, distribution, and change of the world's great cities; urban patterns and functions; emphasis on U.S., Canada.

447 Political Geography 3 I Prereq Geog 102 or 105. Geographic background of world problems and international relations; strategy of men, lands, and resources; geopolitical bases of national power.

449 Historical Geography of the United States 3 II Prereq Geog 102 or 105. Geography in earlier times to provide a background for understanding national development.

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

Schedule of Studies

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses. At least 33 hours are required in Geography.

Before the junior year a student should have completed most of the General University Requirements. At least one year of foreign language at the college level is compulsory (perhaps two, depending on high school prep-
ration) before the granting of a degree in Geography.
During the last two years of undergraduate work, a 15-hour approved minor in a related field is required.

**Freshman Year**

**First Semester**
- Geog 101 Physical 3
- Ing 101 Composition 3
- For L Elective 4
- ROTC or Elective 2
  - E 1/2

**Second Semester**
- Geog 102 Human Geog 3
- Math 201 Finite Math 3
- For L Elective 4
- Soc S Elective 2
- ROTC or Elective 2
  - E 1/2

**Sophomore Year**

**First Semester**
- Geog 105 Fund Ec Geog 3
- Ing 102 Fundamentals 3
- Soc S Elective 3
- Sp 201 Int Comp Pro 2
- Lab Science Elective 4
  - Elective 2
  - ROTC or Elective 2
  - E 1/2

**Second Semester**
- Ing 203 Fundamentals 3
- Ing 201 Inter Comp 3
- Soc S Elective 3
- Lab Science Elective 4
- Elective 2
- ROTC or Elective 2
  - E 1/2

**Junior Year**

**First Semester**
- Geog Elective (Regional) 3
- A 315 Statistics 4
- Science Elective 3
- Approved Minor 3
- Elective 3

**Second Semester**
- Geog Elective (Regional) 3
- Geog Elective (Systematic) 3
- Approved Minor 6
- Elective 3

**Senior Year**

**First Semester**
- Geog Elective (Regional) 3
- Geog Elective (Systematic) 3
- Geog 499 Sp Problems 2
- Approved Minor 3
- Elective 6

**Second Semester**
- Geog Elective 3
- Geog 499 Sp Problems 3-4
- Approved Minor 3
- Elective 6

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

**Department of Geology**

Professor and Chairman of the Department, J. W. Mills; Professors, A. F. Agnew, C. D. Campbell, W. F. Scott, R. K. Sorem; Associate Professors, P. E. Rosenberg, C. R. Schroeder; Assistant Professors, T. L. Hendrick, G. D. Webster; Lecturer, J. W. Crosby; Associate Geologist, Y. H. 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. Students who intend to go into professional geological work should plan on earning an advanced degree.

Well-equipped laboratories and extensive reference collections are used in the study of rocks, minerals, fossils, and geologic maps. Microscopes, x-ray diffraction and fluorescence equipment, experimental apparatus for mineral synthesis at high temperatures and pressures, and a drafting room are in regular use. The departmental branch of the library provides ready access to important geological literature.

The department offers courses of study leading to the degrees of Bachelor of Science in Geology, Master of Science in Geology, and Doctor of Philosophy.

**Description of Courses**

For explanation see Index under "Symbols"

**General Geology**

Geol 101 [P] Introductory Geology 4 (3-2) The earth, its materials, and an introduction to its history.

Geol 302 [P] Historical Geology 4 (3-3) II Prereq Geol 101. History and development of the earth's physical features and its inhabitants.

Geol 307 (208) Field Preparation 2 (1-3) II Prereq Math 107; Geol 340.
Stratigraphy and Paleontology

Geol

310 Invertebrate Paleontology 4 (3-3) I
Prereq Geol 302. Systematic study of morphology, classification, evolution, and ecology of fossil invertebrate organisms, including microfossils and calcareous algae.

420 (402) Stratigraphy 4 (3-3) II Prereq Geol 310, 340. Principles of dating and correlating sedimentary strata; recognition of ancient depositional environments to reconstruct geologic history.


523 Advanced Topics in Stratigraphy 2 May be repeated for credit. II 1970-71 a/y. Prereq Geol 420.


Structural Geology

Geol

340 Geologic Structures 4 (3-3) I Prereq Geol 252.


541 Structural Analysis 3 (2-3) II 1971-72 a/y. Prereq Geol 340. Structural analysis of regions subjected to multiple deformation.

Mineralogy

Geol


251 Mineralogy of Mineral Deposits 2 (1-3) II Prereq Geol 250; Chem 101. Minerals of economic value; advanced testing methods; modern applications of mineralogy.

252 Hand Specimen Petrology 3 (1-6) II Prereq Geol 250. Origin and classification of major rock types; conditions of formation, petrologic theory, specimen identification. Field trip required.

551 Ore Microscopy 2 (0-6) or 3 (0-9) II 1971-72 a/y. Prereq Geol 251, 470. Identification of ore minerals using polarizing ore microscope; measurement of rotation properties; interpretation of ore textures; photomicrography; practical problems.

552 X-ray Analysis in Geology 3 (2-3) I Prereq Geol 251, 360, or c/. Internal symmetry of crystals; generation and use of X rays in geological research; theory and practice of powder diffraction and fluorescence.

553 Advanced Topics in Mineralogy 2 II 1970-71 a/y. Prereq Geol 552. Group discussion of recent advances or classic problems in mineralogy; advanced work in x-ray or ore microscopy laboratories.

Petrology

Geol

360 Optical Mineralogy and Petrography 3 (2-3) I Prereq Geol 252; Phys 102 or 202. Elements of optical determination of minerals and rocks.

560 Petrography 4 (2-6) II 1971-72 a/y. Prereq Geol 360. Origin and relations of the important rock types, with practice in microscopic determination and description of rock sections.

Metamorphism 3 (2-3) II 1971-72 a/y. Prereq Geol 360. Metamorphic minerals, rocks, processes, and facies. Cooperative course taught at the University of Idaho.

Economic Geology


70 Metallic Mineral Deposits 2 I 1971-72 a/y. Prereq Geol 470. The geology of some of the world's leading mineral deposits.

71 Nonmetallic Mineral Deposits 2 I 1970-71 a/y. Prereq Geol 470. The geology of some of the world's leading nonmetallic mineral deposits.

73 Advanced Topics in Economic Geology 2 May be repeated for credit. II 1971-72 a/y. Prereq Geol 470. Discussions of recent contributions to our knowledge of the origin of mineral deposits.

75 Geology of Underground Water 3 I 1970-71 a/y. Prereq Ag M 344, C E 315, or Geol 340. Geologic principles underlying the accumulation and movement of ground water; its development and exploitation.

Geochemistry

80 Introductory Geochemistry 2 I 1971-72 a/y. Prereq Chem 106 or 120; Geol 252. The chemistry of earth materials and processes.


82 (554) Mineralogical Geochemistry 3 I 1970-71 a/y. Prereq Geol 360 or Chem 331. Structural geochemistry of the silicates; principles of geochemical equilbrium and mineral stability.

85 Geochemical Exploration 3 (2-3) I Principles and use of rapid chemical tests of rock, soil, sediment, vegetation, or water samples in prospecting for mineral deposits. Cooperative course taught at the University of Idaho.

Schedule of Studies

At least 29 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

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Sophomore Year

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<tr>
<td>Geol 250 Rock Forming Minerals</td>
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<td>Math 107 Precalculus</td>
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<td>Geol 251 Mineral Deposits</td>
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<td>Geol 252 Hand Specimen Petrology</td>
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<td>Math 171 Calculus I</td>
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Junior Year

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<tr>
<td>Geol 340 Geologic Structures</td>
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<tr>
<td>Phys 101 or 202</td>
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</tr>
<tr>
<td>Geol 310 Invert Paleontology</td>
<td>4</td>
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<tr>
<td>Bio S Elective</td>
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<td>Geol 307 Field Preparation</td>
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Summer Session

| Geol 308 Field Methods | 8 |

Senior Year

(Interchangeable Semesters)

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<tbody>
<tr>
<td>Geol 360 Optical Mineralogy</td>
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<tr>
<td>Geol 475 or Elective</td>
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<tr>
<td>Elective</td>
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</table>

| Elective              | 2-8   |
Second Semester
For L Elective 4
Elective 2-8

* Must complete three of the following during the senior year: Geol 420, 430, 470, 480. Courses printed in Roman type are required for graduation, in italics are optional.

Preparation for Graduate Study
As preparation for work toward an advanced degree in geology, a student should have completed, or should plan to take without graduate credit, the following or their equivalents: 35 semester hours of undergraduate courses in geology including Geol 101, 250, 251, 252, 302, 308, 310, 340, 360; one year of general physics; one year of general inorganic chemistry; mathematics through introduction to calculus. It is recommended that one year of calculus be taken as preparation for graduate programs in physical geology fields, where physical chemistry, engineering, and statistics courses would be desirable additions.

Department of History


Offerings in the field of history may be classified as American, Asian, European, and Latin American.

The department offers courses of study leading to the degrees of Bachelor of Arts in History, Bachelor of Arts in Social Studies, Master of Arts in History, Master of Arts in the Teaching of Social Studies, and Doctor of Philosophy (History). The Department of History, in cooperation with the Department of English, also offers the degree of Doctor of Philosophy (American Studies).

Description of Courses

Hist For explanation see Index under "Symbols"

101 [S] Europe 1500 to 1815 3
102 [S] Europe Since 1815 3
120 [S] American History to 1865 3
121 [S] American History Since 1865 3
198 [S] History Honors 3
240 [S] Latin America, The Colonial Period 3 I
241 [S] Latin America, The National Period 3 II
250 [S] Introduction to South Asian Culture 3 I Hinduism, Buddhism, Jainism; traditional social organization; impact of Islam; British imperialism; independent India and Pakistan.
251 [S] Introduction to East Asian Culture 3 II Civilizations of China and Japan.
303 Greece and the Orient 3 I
304 Rome and the West 3 II
306 History of England to 1485 3 I Survey of English history; intellectual and cultural development.
307 History of England Since 1485 3 II Continuation of Hist 306.
308 The Middle Ages 3 I 1970-71 a/y. A survey of the main institutions and ideas giving form to European life between 500 and 1500.
320 Methods of Teaching Social Studies 2
320 [S] History of the Development of Science 3 II Prereq 6 hrs science; 6 hrs Soc S. Science seen as the major characteristic of Western Civilization; its influence on society and the individual.
370 [S] Afro-American History 3 II
390 [H] Early Byzantine Empire, A.D. 330-1081 3 I History and civilization of the surviving Roman Empire, predominantly Greek and Christian, in the medieval Eastern Mediterranean.
391 [H] Later Byzantine Empire, A.D. 1081-1453 3 II History and civilization of the surviving Roman Empire, predominantly Greek and Christian, in the medieval Eastern Mediterranean.
400 History of Canada 3 II
404 History of Europe 1648 to 1789 3 I 1971-72 a/y. Prereq 6 hrs Hum or Soc S. The beginnings of the modern viewpoint in the age of mercantilism, enlightened despotism, and imperial rivalry.
405 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815 3 II 1971-72 a/y.
406 Europe and the World, 1815 to 1914 3 I
407 Europe and Two World Wars, 1914 to 1945 3 I Political, intellectual, economic, and international aspects of European life during and between two world wars.
408 Europe Since 1945 3 II Political, intellectual, economic, and international aspects of European life since World War II.

410 History of Russia to 1825 3 I

411 History of Russia Since 1825 3 II

412 East Europe and the Balkans 3 I East Europe and the Balkans in the 19th and 20th centuries.

413 History of Mexico 3 I War of Independence, 19th century Mexico and the liberal-conservative struggle; modern Mexico since the Revolution of 1910.

414 Inter-American Relations 3 II Same as Pol S 414.

415 The "ABC" Nations of South America 3 II 1970-71 a/y. Argentina, Brazil, and Chile since independence emphasizing the similarities and differences in their respective economic, social, and political development.

419 Twentieth Century Latin America 3 I Contemporary developments, policies, and trends in the Latin American states.

420 British India, 1757-1947 3 I Impact of westernization, socio-religious reform movements, and revivalism; styles of nationalism; Muslim separatism; the Gandhian era.


423 Twentieth Century East Asia 3 II 1970-71.

424 South Asia Since 1947 3 II Traditional society; village, caste, and tribe; impact of nation-building on tradition; comparative analysis of Indian and Pakistani political systems.

425 (426) American Diplomatic History 1776-1900 3 I Policies and principles characteristic of American diplomacy from 1776 to 1914.

426 American Diplomatic History in the Twentieth Century 3 II

427 United States Foreign Relations 3 I Same as Pol S 427.

428 European Diplomacy 1848 to 1914 3 I 1970-71 a/y.

429 European Diplomacy Since 1914 3 II 1970-71 a/y.


433 Stuart England 3 II 1970-71 a/y.

434 American Political Thought 3 I 1970-71 a/y. Same as Pol S 454.

435 The Renaissance 3 I Prereq 6 hrs Soc S or Hum. Europe from 1500 to 1600; the impact on medieval institutions of capitalism, technology, and the rediscovery of the Ancient World.

436 The Reformation 3 II Prereq 6 hrs Soc S or Hum. Europe from 1500 to 1648; the effects of religious reform, geographic discovery, and developing nation states.

437 Classical Political Thought 3 I 1971-72 a/y. Same as Pol S 437.

438 Recent Political Thought 3 II Same as Pol S 438.


443 (452) Civil War and Reconstruction 3 II Emphasizes the Civil War as a problem in historical causation and the social, political, and economic impact of the war.

444 Gilded Age in American History 3 I Response to industrialism and the economic, social, and political realignment of American society in late 19th century.

445 (443) United States 1901-1932 3 I U.S. during the progressive era, World War I, and normalcy.

446 (444) United States Since 1932 3 II U.S. during the depression, New Deal, World War II, the cold war, and the age of affluence.

448 American Constitutional History 3 I 1971-72 a/y. Prereq Hist 120 or Pol S 101.

451 The Westward Movement 3 II The American frontier and its importance in American history.

455 Political and Social History of the Pacific Northwest 3 Fulfills the teaching certification requirement in state history and government in Washington and other Pacific Northwest states.

458 Social and Intellectual History of the United States 3 Prereq senior standing.

472 Britain in the Nineteenth Century 3 I Political, constitutional, and social development in Great Britain from the Napoleonic wars to the death of Victoria in 1901.

473 Britain in the Twentieth Century 3 II Britain from Boer War to the present.

491 Seminar 3 May be repeated for credit.
Department of History

499 Special Problems 1-4 May be repeated for credit.
501 Seminar in History 2 May be repeated for credit.
504 Seminar in Modern European History 3 May be repeated for credit. Prereq 12 hrs Hist.
510 Seminar in Russian and East European History 3 II May be repeated for credit. Prereq 12 hrs Hist.
513 Seminar in American Studies 3 May be repeated for credit. Same as Engl 513.
540 Seminar in Latin American History 3 I May be repeated for credit. Prereq 12 hrs Hist.
543 Seminar in American History 3 May be repeated for credit. Prereq 12 hrs Hist.
551 Recent German History 3 I 1970-71 a/y. Nazi and post World War II institutional and intellectual developments.
580 Historiography 3 I Prereq 20 hrs Hist.
581 American Historiography 3 II
598 The Teaching of History in College 1 Theory, problems, and methods of teaching history at the college level.
599 Special Problems 1-4 May be repeated for credit.
600 Research, Thesis, or Examination Variable credit.

Second Semester

<table>
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<tr>
<th>Course Type</th>
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<tbody>
<tr>
<td>Hist 200-level Courses</td>
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<tr>
<td>Hist 300- or 400-level Courses</td>
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<tr>
<td>Minor Elective</td>
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Senior Year

First Semester

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<tr>
<td>Hist 400-level Courses</td>
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<td>Minor Elective</td>
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<td>Engl Elective</td>
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<tr>
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Second Semester

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<th>Course Type</th>
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<td>Engl Elective</td>
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<tr>
<td>Elective</td>
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</table>

Electives in history should include at least one semester of seminar. Thirty-two hours of history are required for a major.

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

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.

Preparation for Graduate Study

Students who have had basic undergraduate training in European and American history (approximately 12 hours) and who have had undergraduate majors in such subjects as American literature, economics, anthropology, and political science may be well prepared for graduate study in several fields of specialization in history. Adequate opportunities are provided for removing deficiencies by taking appropriate courses or special examinations.

Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this department should elect courses similar to those required in the above schedule of studies.
Home Economics

Dean Jane E. Werden, Adviser. For instructional staff, see departments in the College of Home Economics.

Description of Courses

H E For explanation see Index under "Symbols"

401 Seminar 2
499 Special Problems 1-4 May be repeated for credit.
501 Seminar 1 May be repeated for credit.
503 Research Methodology 2 Methodology as applied to all areas of home economics.
599 Special Problems 1-4 May be repeated for credit.
600 Research, Thesis, or Examination Variable credit.

Home Economics Education

Professor and State Supervisor, Alberta Hill; Assistant Professor and State Supervisors, Joane Wohlgemann, Pearl Wheaton.

This program meets the requirements for the certificate in vocational home economics as outlined by the State Board for Vocational Education. The certificate requires 40 hours in home economics courses with a minimum of 6 hours in the areas of clothing and textiles, foods and nutrition, home management and interior design, with a minimum of 8 hours in the area of child development. Additional hours in home economics should be taken under departmental advisement.

The course of study leads to the degree of Bachelor of Science in Home Economics.

Schedule of Studies

At least 32 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Option A

Freshman Year

First Semester

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<td>Engl 101 Composition</td>
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<tr>
<td>C T 107 Design Analysis</td>
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<td>Soc 101 Introduction</td>
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Second Semester

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Sophomore Year

First Semester

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<td>Chem 240 Organic</td>
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<td>C T 215 Textiles</td>
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<td>FNIM 120 or 121</td>
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<tr>
<td>CFS 247 Family Relationships</td>
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Second Semester

<table>
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<td>FNIM 266 Household Equipment</td>
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Junior Year

First Semester

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<td>Educ 301 Secondary Schools</td>
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<td>CFS 353 Family Housing</td>
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<td>F A 105 Basic Design</td>
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Second Semester

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<td>Educ 343 Teaching H E</td>
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Senior Year

First Semester

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<td>Educ 401 Evaluation of Learning</td>
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Second Semester

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<td>Educ 443 H E Education</td>
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<td>Educ 405 Directed Teaching</td>
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<td>Educ 403 Social Foundations</td>
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<td>VTE 440 Foundations</td>
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Courses printed in Roman type are required for graduation, in italics are optional.

Option B

Freshman Year

First Semester

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<tr>
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<tbody>
<tr>
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<td>Psych 101 Prin of Behavior</td>
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<td>Hum Elective</td>
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Second Semester

<table>
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<td>Psych 101 Prin of Behavior</td>
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<td>Hum Elective</td>
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Honors Program

Second Semester
C T 107 Design Analysis 3
Educ 101 Introduction 2
Soc 101 Introduction 3
C T 112 Clothing 3
Chem 101 Introductory 4
P E 1/2

Sophomore Year

First Semester
Zool 251 Intro Hum Physiol 4
CFS 240 Child Development 3
CFS 242 Directed Observation 1
FNIM 266 Household Equip 3
Engl Comp Elective 3
Soc S Elective 2
P E 1/2

Second Semester
Econ 201 Principles 4
C T 215 Textiles 3
CFS 247 Family Relationships 3
FNIM 120 or 121 3
Approved Elective 2
P E 1/2

Junior Year

First Semester
Econ 312 or Soc 351 3
Educ 301 Secondary Schools 4
F A 105 Basic Design 2
CFS 353 Family Housing 3
H E Elective 3

Second Semester
Educ 343 Teaching H E 2
CFS 350 Decision Making 3
Elective 6
Soc S Elective 3

Senior Year

First Semester
CFS 450 Home Management 3
CFS Elective 2-3
Educ 401 Eval of Learning 3
Elective 5-6

Second Semester
Educ 443 H E Education 2
Educ 405 Directed Teaching 8
Educ 403 Social Foundations 3
VTE 440 Foundations 3

Foods and Nutrition: FNIM 120, 121, 130, 266, 268, 334.

Interior Design: I D 170, 475.

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

Honors Program

V. N. Bhatia, Coordinator

The primary objective of the Honors Program is to provide enriched educational opportunities for the superior student. The program offers a plan to promote an appreciative understanding of the physical and cultural world designed to supplement and strengthen more specialized training in the major field. It will also provide the opportunity and the stimulus for the superior student to develop his creative ability.

The Honors Program involves all departments and colleges and includes honors courses throughout the student's undergraduate career. Each department or college may offer special work for its Honors Program students in addition to the University Honors courses.

Each year approximately ten per cent of the entering freshman class will be encouraged to investigate the possibility of entering the Honors Program. Freshmen for the program will be selected on the basis of high school grade point averages, scores from college and precollege testing programs, and information obtained from the student and his school advisers. Students invited into the program must qualify for Engl 198 and either Math 107 or Math 198 and enroll in U H 101.

The eligibility of transfer and foreign students will be judged by the Honors Council in consultation with appropriate advisers in each individual case on the basis of the student's knowledge and competence in the work which he has done elsewhere. Such students ordinarily will not be considered for admission in the Honors Program after the beginning of their junior year.

Students who are not admitted in the initial selection may petition the Honors Council to enter the Honors Program at any time after the end of their first semester but not later than the end of the sophomore year. For continued enrollment in the Honors Program, a student must maintain an overall B average (3.00) and must maintain this same average in honors work. Students in the Honors Pro-
gram are not required to complete the General University Requirements for Graduation.

A student may drop out of the Honors Program at any time within existing university rules, and the honors courses he has taken will be applied toward the General University Requirements for Graduation.

University graduation honors will be one of three kinds: (1) Honors, (2) High Honors, and (3) Highest Honors. Only students who are enrolled in the Honors Program and complete it successfully can be so graduated. Graduation with "Distinction" is possible for students not enrolled in the Honors Program.

In general, the same standard of performance is expected of these students as of those in the Honors Program, except that special weight shall be given to work in the major field. For further details see the Honors Program brochure.

Honors courses are open to students enrolled in the Honors Program and to students of superior ability in the particular field as permitted by the department offering the course.

Description of Courses

For explanation see Index under "Symbol"

Anth 198 [S] Anthropology Honors 3
Bio S 298 [B] Biological Science Honors 4 (3-3) II Prereq Ph S 298.
Econ 198 [S] Economics Honors 3
Engl 198 [C] Composition Honors 3 I
Engl 199 [H] English Composition and Literature Honors 3 II Prereq Engl 198.
Fren 198 French Honors 4 I
Fren 199 [H] French Honors 4 II Prereq Fren 198.
Ger 198 German Honors 4 I
Ger 199 [H] German Honors 4 II Prereq Ger 198.
Hist 198 [S] History Honors 3
Math 198 [Z] Mathematics Honors 3 I
Ph S 298 [P] Physical Science Honors 4 (3-3) I Prereq Math 107 or 198.
Pol S 198 [S] Political Science Honors 3
Psych 198 [S] Psychology Honors 3
Soc 198 [S] Sociology Honors 3

U H 101 University Lectures and Readings 1 I

102 University Lectures and Readings 1 II

103 University Lectures and Readings 1 III

200 Sophomore Summer Reading Examination 1-3 Required of all sophomore Honors Program students. Examination to be taken during first six weeks of first semester of sophomore year. Variable credit depending on extent and quality of summer reading. Selection is from lists prepared by departments and Honors Council.

300 Junior Summer Reading Examination 1-3 Required of all junior Honors Program students. 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. Selection is from lists prepared by departments and Honors Council.

350 Development of Western Civilization 3 Required of all Honors Program students in their junior or senior year. Open to other juniors and seniors with approval of Honors Council.

400 Senior Summer Reading Examination 1-3 Required of all senior Honors Program students. Examination to be taken during first six weeks of first semester of senior year. Variable credit depending on extent and quality of summer reading. Reading is from lists prepared by departments and Honors Council.

440 Domain of the Arts 3 Required of all Honors Program students in their junior or senior year. Open to other juniors and seniors with approval of Honors Council.

450 Senior Thesis or Project 1-4 May be repeated for credit. Thesis or project directed by student's major department.

460 Seminar 2 May be repeated for credit. Prereq senior standing in Honors Program. Varying topics.

498 Senior Comprehensive Examination 1 Required of all Honors Program seniors. Administered by student's major department.

499 Special Problems 1-4 May be repeated for credit.
Schedule of Studies

For Honors Program students the following courses or approved substitutes are required. Honors Program students are strongly urged to take two semesters of Foreign Language in either French or German. (In five-year programs, the junior and senior years may be interpreted as III, IV, or V.)

The student in his 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. He must also take Math 198 or approved substitute.

Freshman Year

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<td>Math 107 or 198</td>
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<td>Engl 199 Honors</td>
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<td>Soc S Honors</td>
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<td>U H 102 Lect and Readings</td>
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Sophomore Year

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<td>Ph S 298 Honors</td>
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Junior Year

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<td>U H 330 Western Civilization</td>
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<td>U H 350 Eastern Civilization</td>
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Senior Year

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<td>U H 440 Domain of the Arts</td>
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Second Semester

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

Department of Horticulture

Professor and Chairman of the Department, W. B. Ackley; Professors, H. T. Abbott, E. W. Kalin, C. G. Woodbridge; Associate Professors, D. R. Bienz, F. E. Larsen, C. W. Nagel, M. E. Patterson, M. J. Powers; Assistant Professors, C. L. Pfeiffer, D. A. Smitle.

The courses are designed to give instruction in the principles and practices of fruit and vegetable production and utilization, floriculture, nursery management, and landscape architecture. Stress is given to the principles of plant propagation, management, and growth upon which cultural practices are based. Courses in horticulture and supplementary courses in other departments are designed to fit men and women for work in fruit or vegetable growing, in fruit and vegetable handling and processing, in marketing organizations, in state and federal departments of agriculture, and in commercial nursery work and related fields. Courses in floriculture and landscape architecture prepare students for work in greenhouse management, as park superintendents, or as landscape architects.

The department offers courses of study leading to the degrees of Bachelor of Science in Horticulture, Master of Science in Horticulture, Master of Science in Food Science, and Doctor of Philosophy (Food Science, Horticulture).

Description of Courses

Hort For explanation see Index under “Symbols”

101 General Horticulture 3 (2-3) Science and art of growing and handling tree and small fruits, ornamentals, flowers, and vegetables.

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.

211 Fruit Growing 3 (2-3) II Prereq Hort 101. The fruit industry: location, varieties, propagation, pruning, thinning, soil management, irrigation, winter injury, harvesting, and handling.
213 Small Fruit Culture 3 I 1970-71 a/y. Field trip required. Botanical relationships, plant characteristics, fruiting habits, varieties, location, culture, marketing, and utilization of small fruits.

220 Vegetable Crops 3 I Prereq Hort 101 or a plant science course. Culture of crops for home and market; importance, varieties, seed sources, climate, planting, cultivation, irrigation, harvesting, storage, markets, and pests.

231 Ornamental Plant Materials I 3 (2-3) I Prereq Hort 101 or Bio S 101. Characteristics, ecology, identification, and nomenclature of important herbaceous and woody plant species as related to proper selection and use.

232 Ornamental Plant Materials II 3 (2-3) II Prereq Hort 101 or Bio S 101. Continuation of Hort 231.

235 Greenhouse Construction and Management 4 (3-3) I 1971-72 a/y. Prereq Hort 101; Soils 201. Field trip required. Methods and materials; heat, ventilation, light, and humidity control; soil, fertilizer, and water management; bench crops and pot plant behavior.

251 Propagation of Plants 2 (1-3) II Prereq Hort 101 or Bio S 101. Field trip required. Principles and methods of multiplying herbaceous and woody plants and their handling up to usable size.

260 Principles of Landscape Design 3 I History, principles, and practices of design applied to the home grounds.

263 Basic Landscape Design 3 (1-6) II Techniques and media for presentation of landscape designs; problems with residential details.

280 Elementary Food Processing 2 II 1971-72 a/y. Prereq Chem 101; one sem Bio S. Commercial food processing methods; applications to fruits and vegetables.

336 Commercial Flower Design and Retail Shop 3 (1-6) I 1970-71 a/y. Prereq Hort 154, 235. For floriculture majors. Design and use in commercial shops; church and hall decorations; floral merchandising and supplies, store management, and shop arrangement.

345 Plant Breeding 3 (2-3) II Prereq Genet 301. Field trip required. Genetic principles applied to the improvement of plants.

363 Park Design and Construction 3 II Prereq a design course. For majors in landscape design, physical education, and recreation. Principles and procedures.

364 Landscape Design 3 (0-9) I Prereq Hort 263. Design of small private and public properties; landscape construction; elementary planting studies.

365 Landscape Planting Design 3 (0-9) II Prereq Hort 364. Use of ornamental plant materials in landscape development; emphasis on plant form, color, growth habits, and ecological relationships.


418 Post-Harvest Physiology 3 (2-3) I 1971-72 a/y. Prereq Hort 101 or Bio S 101; Bot 320. Field trip required. Physiological and chemical basis for handling and storage practices; dormancy, maturation, ripening, and senescence phenomena; physiological disorders; refrigeration principles.

425 Current Topics in Horticulture 3 I 1971-72 a/y. Prereq Hort 211, 220, or 235; Bot 320 and Genet 301 recommended. Discussion of classical, current scientific, and popular literature on horticultural topics.


456 Seminar I May be repeated for 2 hours credit. Current literature and special reports.

467 Landscape Design and Construction 3 (0-9) I Prereq Hort 365. Design of properties of greater complexity; construction details.

468 Landscape Design and Service 3 (0-9) II Prereq Hort 467. Continuation of Hort 467. Practice and problems in landscape design; contracts and specifications applied to landscape practice.
Department of Horticulture

(485) **Principles of Food Preservation** 3 II Prereq Chem 240; Bact 216. Field trip required. Principles of food product manufacture, preservation, and utilization.

(486) **Fruit and Vegetable Products** 4 (3-3) 1 Prereq Hort 470. Field trip required. Specialized techniques and practices of fruit and vegetable processing and marketing.

Special Problems 1-4 May be repeated for credit.

**Principles of Horticultural Research** 2 (1-3) II 1971-72 a/y. Physical methods of analyses.


Seminar 1 May be repeated for credit.

**Advanced Pomology** 3 II 1970-71 a/y. Prereq Hort 416. Modern concepts and current research; commercial problems.

**Advanced Horticulture** 3 II 1970-71 a/y. Physiological effects of light, temperature, moisture, and nutrients on the growth and productivity of plants.

**Product Development and Research** 2 I 1971-72 a/y. Prereq Hort 471; Math 171. Principles of complex processing operations; contemporary food processing research.

Special Problems 1-4 May be repeated for credit.

**Research, Thesis, or Examination Variable credit.**

### Schedule of Studies

Students in horticulture may take work in Fruit and Vegetable Production, Ornamental Horticulture, Food Science, or Landscape Architecture.

At least 20 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

### Fruit and Vegetable Production

#### Freshman Year

**First Semester**

- Hort 101 General 3
- Engl 101 Composition 3
- Chem 105 Principles 4
- Hum or Soc S Elective 3
- ROTC or Elective 2
- P E 1/2

**Second Semester**

- Bio S 103 Introductory 4
- Spe 112 Fundamentals 3
- Chem 106 Principles 4
- Hum or Soc S Elective 3
- ROTC or Elective 2
- P E 1/2

#### Sophomore Year

**First Semester**

- Hort 220 Veg Crops 3
- Bot 201 Intermediate 4
- Econ 201 Principles 4
- Soils 201 Soils 3
- ROTC or Elective 2
- P E 1/2

**Second Semester**

- Hort 211 Fruit Growing 3
- Chem 240 Elem Org Chem 4
- Com, Engl or Spe Elective 3
- Elective 4
- ROTC or Elective 2
- P E 1/2

#### Junior Year

**First Semester**

- Hort 418 or Ag M Elective 3
- Bot 320 Plant Physiology 3
- PL P 329 General 3
- Genet 301 Genetics 3
- Hort Elective* 4

**Second Semester**

- Hort 416 or Hort Elective* 3
- Entom 340 Ag Entomology 3
- Soils 301 Soil Management 2
- Elective 8

#### Senior Year

**First Semester**

- Hort 418 or Ag M Elective 3
- Hort 456 Seminar 1
- Hort Elective* 3
- Elective 9

**Second Semester**

- Hort 416 or Hort Elective* 3
- Hort 456 Seminar 1
- Elective 11

* Electives totaling at least 9 hours must be taken from Hort 213, 235, 251, 260, 280, 345, 399, 417, 425.

Courses printed in Roman type are required for graduation, in italics are optional.
## Ornamental Horticulture

### Freshman Year

**First Semester**  
- Hort 101 General  
- Eng 101 Composition  
- Chem 105 Principles  
- Hum or Soc S Elective  
- ROTC or Elective  
- P E  
  
**Hours**  
3  
3  
4  
3  
2  
1/2  

**Second Semester**  
- Bio S 103 Introductory  
- Chem 106 Principles  
- Hort 251 Propagation  
- Hum or Soc S Elective  
- P E  
  
**Hours**  
4  
4  
2  
2  
1/2  

### Sophomore Year

**First Semester**  
- Hort 231 Plant Materials I  
- Chem 240 Elem Org Chem  
- Econ 201 Principles  
- Com or Engl Elective  
- ROTC or Elective  
- P E  
  
**Hours**  
3  
4  
4  
3  
2  
1/2  

**Second Semester**  
- Hort 232 Plant Materials II  
- Bot 201 Intermediate  
- B A 230 Prin of Acctg  
- Soils 201 Soils  
- ROTC or Elective  
- P E  
  
**Hours**  
3  
4  
3  
2  
1/2  

### Junior Year

**First Semester**  
- Hort 235 Grh Const and Mgt  
- Bot 320 Plant Physiology  
- PL P 329 General  
- Option requirement or Elective  
  
**Hours**  
4  
3  
3  
5  

**Second Semester**  
- Entom 340 Ag Entomology  
- Spe 112 Fundamentals  
- Soils 301 Soil Management  
- Option requirement or Elective  
  
**Hours**  
3  
3  
2  
7  

### Senior Year

**First Semester**  
- Hort 456 Seminar  
- Option requirements or Elective  
  
**Hours**  
1  
14  

**Second Semester**  
- Hort 456 Seminar  
- Option requirements or Elective  
  
**Hours**  
1  
14  

### Floriculture Option—Those students in Floriculture must take the above listed courses plus the following: Hort 134, 220, 260, 336, 438; Ag M Elective.

### Nursery Management Option—Those students in Nursery Management must take the above listed courses plus six additional hours in Horticulture.

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

## Food Science

(Offered jointly by Animal Sciences and Horticulture)

### Freshman Year

**First Semester**  
- Eng 101 Composition  
- A S 170 Fd Industry  
- Chem 105 Principles  
- Math 107 Precalculus  
- ROTC or Elective  
- P E  
  
**Hours**  
3  
2  
4  
3  
2  
1/2  

**Second Semester**  
- Chem 106 Principles  
- Spe 112 Fundamentals  
- Hum or Soc S Elective  
- A S 102 or Hort 101  
- ROTC or Elective  
- P E  
  
**Hours**  
4  
3  
3  
3  
2  
1/2  

### Sophomore Year

**First Semester**  
- Bio S 103 Intro Biol  
- A S 270 Fd Select and Appraisal  
- Phys 101 General  
- Chem 240 Elem Org Chem  
- ROTC or Elective  
- P E  
  
**Hours**  
4  
2  
4  
4  
2  
1/2  

**Second Semester**  
- Bact 201 Gen Microbiol  
- Eng 201 Inter Comp  
- Phys 102 General  
- Econ 201 Principles  
- ROTC or Elective  
- P E  
  
**Hours**  
4  
3  
4  
4  
2  
1/2  

### Summer Session

**Summer Experience**

### Junior Year

**First Semester**  
- Bact 416 Micro of Foods  
- Chem 221 or 217  
- A S 370 Fd Chem  
- Ag Ec 350 Ag Bus Mgt  
- A S 200 Prin Nutrition  
  
**Hours**  
3  
4  
4  
3  
3  

**Second Semester**  
- A S 371 Fd Analysis  
- F S 403 Ag Process  
- Hort 470 Prin Fd Pres  
- A S or Hort Elective  
- Hum or Soc S Elective  
  
**Hours**  
4  
3  
3  
3  
3
Summer Session
Summer Experience

Senior Year

First Semester
Hort 471 Fruit and Veg Prod 4
A S 472 Dairy Products 4
Elective 7

Second Semester
A S 473 Meat and Poul Prod 4
F S 474 Cereal Products 3
Elective 8

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

Landscape Architecture

Freshman Year

First Semester
Engl 101 Composition 3
Bio S 101 Integrated 3
Math 107 Precalculus 3
Arch 161 Graphics 2
Geog 102 Human Geography 3
ROTC or Elective 2
P E 1/2

Second Semester
Geol 101 Introductory 4
C E 101 Surveying 3
Arch 162 Graphics 3
Spe 112 Fundamentals 3
F A 121 Drawing 2
ROTC or Elective 2
P E 1/2

Sophomore Year

First Semester
Hort 260 Principles 3
Arch 263 Graphics 3
Arch 271 Basic Design 3
Hort 231 Orn Plant Mat I 3
Elective 2
ROTC or Elective 2
P E 1/2

Second Semester
Hort 263 Basic Landscape Design 3
Hort 232 Orn Plant Mat II 3
Chem 101 Introductory 4
Arch 255 Architectural Drawing 3
ROTC or Elective 2
P E 1/2

Junior Year

First Semester
Hort 364 Landscape Design 3
Soils 201 Soils 3
Arch 220 Building Materials 3
Elective 3

Second Semester
Hort 365 Landscape Planting Design 3
Soils 416 Air Photo Interp 2
B A or Econ Elective 3-4
Arch or F A History Elective 3
Hort 363 Park Design and Constr 3
Hort 456 Seminar 1

Senior Year

First Semester
Hort 467 Landscape Des Const 3
Arch 358 Residence Arch 3
Humanities Elective 3
Hort 456 Seminar 1
Elective 5

Second Semester
Hort 468 Land Des and Service 3
Arch 485 City Plan 3
For 471 Forest Recreation 3
Agron 301 Turf Management 2
Elective 4

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

Preparation for Graduate Study

Students with undergraduate majors in such subjects as horticulture, botany, and plant physiology as well as those with undergraduate majors in chemistry and agronomy may be well prepared for graduate study in this department.

Undergraduate students who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in the Department of Horticulture will do well to elect as many courses in the basic physical and biological sciences as possible.

Hotel and Restaurant Administration

J. T. Bradley, Adviser. For instructional staff see Department of Business Administration.

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, a very important one in the economic life of Washington and the country as a whole. 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 home economics as well as in hotel and
restaurant management. The course of study leads to the degree of Bachelor of Arts in Hotel Administration.

**Description of Courses**

H A For explanation see Index under "Symbols"

181 Orientation I I Prereq Not open to juniors and seniors. Historical development and future of the hotel and restaurant management field.

280 Hotel Organization I 4 II Prereq H A 181; B A 230. Management functions relating to the planning and operational policies of various hotel departments.

281 Hotel Organization II 3 I Prereq B A 201, 230; H A 280. Advanced management methods and concepts utilized in the administration of hotels.

387 Restaurant Management 3 I Prereq FNIM 280; B A 231; Math 201. Problems encountered in the management of various kinds of restaurants: location, financing, production methods, personnel, and sales.

480 Hotel Management 3 II Prereq senior in H A; Math 201, 202; B A 325, 333. Use of the case method in the analysis of current management problems.

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

**Schedule of Studies**

At least 38 of the total hours required for the bachelor's degree in this program must be in upper-division courses. More than 40 per cent of the work must be in subjects other than business and economics.

**Freshman Year**

**First Semester**

- Engl 101 Composition 3
- H A 181 Orientation 1
- FNIM 120 Food Preparation 3
- Chem 101 Introductory 4
- Math 201 Finite Math 3
- Psych 101 Prin of Behavior 3
- ROTC or Elective 2
- P E 1/2

**Second Semester**

- Spe 112 Fundamentals 3
- Bact 101 Elementary 4
- Math 202 Math Analysis 3
- Hum Elective 3
- FNIM 130 Nutrition 3
- ROTC or Elective 2
- P E 1/2

**Sophomore Year**

**First Semester**

- Econ 102 Fundamentals 3
- B A 201 Org and Management 3
- B A 230 Prin of Acctg 4
- B A 210 Law and Business 3
- Science Elective 4
- ROTC or Elective 2
- P E 1/2

**Second Semester**

- H A 280 Hotel Organization 4
- Econ 203 Fundamentals 3
- B A 231 Prin of Acctg 3
- FNIM 280 Quant Food Prep 5
- Soc 101 Introduction 3
- ROTC or Elective 2
- P E 1/2

**Junior Year**

**First Semester**

- H A 281 Hotel Organization 3
- B A 360 Marketing 3
- B A 333 Managerial Acctg 3
- B A 350 Personnel 3
- M E 224 Mech Equipment 3

**Second Semester**

- B A 311 Law of Comm Trans 3
- B A 315 Statistics 4
- Econ 350 Labor Econ 3
- Engl 201 Inter Comp 3
- B A 325 Finance 3

**Senior Year**

**First Semester**

- H A 387 Restaurant Mgt 3
- B A 340 Production 3
- FNIM 382 Inst Equipment 3
- A S 216 Institutional Meats 2
- Elective 5

**Second Semester**

- H A 480 Hotel Mgt 3
- FNIM 381 Food Purchasing 4
- Arch 359 Hotel Planning 3
- Elective 3

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

**Transfer Students**

A student planning to transfer to hotel and restaurant administration at the end of the freshman year should have completed the equivalent of the above freshman schedule. Students planning to transfer at a later date will find some difficulty in completing the curriculum within a four-year period, but should have completed the basic courses comparable to Econ 102, 203; B A 210, 230, 231; Math 201 and one year of laboratory sciences.
**Humanities Courses**

Hum For explanation see Index under "Symbol"

101 [H] An Integrated Course in the Humanities 3 Literature, philosophy, history, and art of the ancient world.

102 [H] An Integrated Course in the Humanities 3 An exploration of the ideals of humanism in the literature, philosophy, history, and art of the Middle Ages and the Renaissance.

103 [H] Mythology II Graeco-Roman myths and their influence on art, literature, and music.

201 [H] Greek and Roman Drama 2 I

**Industrial Arts**

W. A. Baksas, Adviser. For instructional staff see Department of Education.

There are two types of programs leading to the degree of Bachelor of Arts in Industrial Arts. The first gives a broad and carefully planned preparation for students who intend to teach industrial arts in the public schools. It gives a prospective teacher a sequence of courses in almost all of the major fields of industrial arts and comprehensive combinations of industrial arts and unrelated fields. It also fulfills the requirements for the Provisional Certificate.

The second type of program prepares the student for entrance into industrial or commercial activities such as small manufacturing and business, contracting, representing manufacturers, and the installation, maintenance, sales, and service of industrial products.

**Description of Courses**

**1A** For explanation see Index under "Symbol"

101 Woodworking Technology I 3 (0-9) Prereq M E 101 or c/. Design and execution of individual woodworking problems, including a study of woods, basic finishing techniques, and allied materials.

110 Industrial Arts Education Orientation 1 I Foundations, objectives, and administration of industrial arts in the public schools.

114 Metalworking Technology I 2 (0-6) Prereq M E 101 or c/. Organization, equipment, management, and instructional materials; problem experiences in art metal, bench metal, gas welding, cutting, and metal spinning.

201 Woodworking Technology II 3 (0-9) Prereq I A 101. Elements in nomenclature; operation of power equipment; working drawings, bill of materials, and routing procedures; use of jigs and fixtures.

212 Advanced Woodworking 2 (0-6) Prereq I A 201.

215 Metalworking Technology II 2 (0-6) Prereq I A 114. Organization, management, and instructional materials for metal programs; problem experiences with precision metalworking machines and arc welding processes.

220 Industrial Craft Processes 3 (1-6) Industrial plastics, leather, and graphic arts; literature of the areas; industrial and educational applications.

230 Contemporary Furniture 3 (1-6) II Prereq I D 370. Required of I D majors; not open to I A majors and minors. Materials and methods used in the fabrication of contemporary furniture.

240 Elements of Electricity 3 (1-6) I Basic elements of direct and alternating current circuits with an introduction to elementary electronics.

252 Building Construction Technology and Practice 3 (1-6)

272 Basic Industrial Arts Design 3 (1-6) Prereq M E 101. Design fundamentals; techniques, materials, and tools employed in the fabrication of industrial arts projects.

316 Power Mechanics 3 (2-3) Prereq I A 240. Power sources and mechanisms; classroom applications.

326 Advanced Metalworking 2 (0-6) Prereq I A 215. Continuation of metal sequence with emphasis on advanced metal processes including machine tool set-ups, foundry, electro-chemical, and design.

333 Methods of Teaching Industrial Arts 2

342 Fundamentals of Radio Communication 3 (1-6) Prereq I A 240. Theory of radio circuits; experience in analyzing, servicing, and constructing communications equipment.

420 Curriculum Materials in Industrial Arts 2 I Prereq 15 hrs I A.

499 Special Problems 1-4 May be repeated for credit.
Schedule of Studies

At least 27 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Industrial Arts Education

Before undertaking this schedule of studies, it is recommended that as major preparation at the secondary school level a student should have completed Educ 101; I A 101, 110, 114, 201; M E 101; Psych 101. At least 4 semester hours should have been completed in a laboratory science such as Chem 101 or Phys 101.

Senior or Junior High School Major

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Educ 201 Human Development</td>
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<tr>
<td>I A 215 Metalworking II</td>
<td>2</td>
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<td>I A 240 Elements of Elec</td>
<td>3</td>
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<tr>
<td>Phys 101 General</td>
<td>4</td>
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<td>ROTC or Elective</td>
<td>2</td>
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<td>P E</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Educ 301 Teach in Sec Sch</td>
<td>4</td>
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<tr>
<td>I A 272 Basic Design</td>
<td>3</td>
</tr>
<tr>
<td>I A 342 Radio Comm</td>
<td>3</td>
</tr>
<tr>
<td>Spe 112 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I A 326 Adv Metalworking</td>
<td>2</td>
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<tr>
<td>Minor Elective</td>
<td>4</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<thead>
<tr>
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<th>Hours</th>
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<tr>
<td>Educ 401 Eval of Learn</td>
<td>3</td>
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<tr>
<td>I A 220 Ind Craft Processes</td>
<td>3</td>
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<tr>
<td>Minor Elective</td>
<td>5</td>
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<td>Hum or Soc S Elective</td>
<td>6</td>
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Senior Year

(Interchangeable Semesters)

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<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I A 335 Methods of Teaching</td>
<td>2</td>
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<tr>
<td>I A 420 Curriculum Materials</td>
<td>2</td>
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<tr>
<td>Minor Elective</td>
<td>4</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td>Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Educ 403 or 404</td>
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<tr>
<td>H Ed 480 or 481</td>
<td>2</td>
</tr>
<tr>
<td>Educ 405 or 406</td>
<td>8</td>
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<tr>
<td>Elective</td>
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Courses printed in Roman type are required for graduation, in italics are optional.

Industrial Arts: Industrial-Technical Training

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>I A 101 Woodworking I</td>
<td>3</td>
</tr>
<tr>
<td>I A 114 Metalworking I</td>
<td>2</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Elective</td>
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</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
</tr>
<tr>
<td>I A 201 Woodworking II</td>
<td>3</td>
</tr>
<tr>
<td>I A 215 Metalworking II</td>
<td>2</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
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Sophomore Year

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<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
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<tr>
<td>Phys 101 General</td>
<td>4</td>
</tr>
<tr>
<td>I A 240 Elements of Elec</td>
<td>3</td>
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<tr>
<td>Econ 201 Principles</td>
<td>4</td>
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<tr>
<td>ROTC or Elective</td>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101 Introductory</td>
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<tr>
<td>Bio S Elective</td>
<td>3</td>
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<tr>
<td>I A 342 Radio Comm</td>
<td>3</td>
</tr>
<tr>
<td>I A 212 Adv Woodworking</td>
<td>2</td>
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<tr>
<td>B A 210 Law and Business</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
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Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I A Elective</td>
<td>2</td>
</tr>
<tr>
<td>I A 252 Bldg Const</td>
<td>3</td>
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<tr>
<td>I A 326 Adv Metalworking</td>
<td>3</td>
</tr>
<tr>
<td>Econ 312 Econ of Consumption</td>
<td>3</td>
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<tr>
<td>B A 340 Production</td>
<td>3</td>
</tr>
<tr>
<td>F A 335 Ceramics</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Cpt S Elective</td>
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<tr>
<td>I A 220 Ind Craft Processes</td>
<td>3</td>
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<tr>
<td>Soc 440 Soc Complex Org</td>
<td>3</td>
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<td>I A 272 Basic Design</td>
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<td>3</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
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</table>
Department of Mathematics

Senior Year

First Semester

Arch 220 Bldg Materials 4
B A 350 Personnel 3
M E 224 Mech Equip 3
Engi 201 Inter Comp 3
Cpt S Elective 2
Hum or Soc S Elective 2

Second Semester

Psych 306 Industrial Psych 3
M E Elective 2
Technical Elective 6
Elective 4-5

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

Preparation for Graduate Study

As preparation for work toward an advanced degree in industrial arts education a student should complete a 30-hour major in the field and apply for a Master of Science degree in Vocational Technical Education.

Program in Literary Studies

Associate Professor and Coordinator of the Program, Conny E. Nelson.

The Departments of English and Foreign Languages offer a program leading to the Doctor of Philosophy degree (Literary Studies).

This interdisciplinary program was established in the conviction that the most fundamental function of literature transcends linguistic and national boundaries. That function is to enrich the human mind and to enlarge its sympathies by causing it to see a succession of visions of human life and by enabling it to explore the aspirations implicit in those visions. This program is designed to encourage the breadth of understanding which a study of several literatures should afford without sacrificing depth.

A student entering the program will have earned a suitable bachelor’s degree. He will be assigned to an advisory committee. By recommending a combination of academic studies in class with free and independent study, the committee will aid and encourage him to become a well-rounded, creative scholar.

Department of Mathematics


The Department of Mathematics provides undergraduate instruction and training in all fields of mathematics. Graduate study and specialization are offered in the following fields: algebra, analysis, applied mathematics, astronomy, geometry, number theory, statistics, topological dynamics, and topology. Instruction in astronomy is enhanced by use of a 12-inch refractor at the Jewett Observatory and a Spitz planetarium. Laboratory instruction in numerical analysis is given at the Computing Center. The mathematics library has sets of over 320 journals in many languages as well as 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.

Entering freshmen whose preparation is sufficiently good, as evidenced by high school records and placement tests, 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 Arts in Mathematics, Master of Arts in Mathematics, Master of Arts in the Teaching of Mathematics, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Mathematics

Math

105 [Z] Arithmetical Concepts 3 For prospective elementary teachers only. Structure of the natural number system; introduction to logic, sets, and formal mathematical systems.
106 [Z] Introduction to Mathematics 3 Prereq 2 yrs high school mathematics. Nature and scope of modern mathematics; axiom systems; relationships to other disciplines.

107 Precalculus Mathematics 3 Prereq 3 yrs high school mathematics and satisfactory Mathematics Placement Test Score. Basic concepts of algebra, trigonometry, and analytic geometry.


172 (208) Calculus II 4 Prereq Math 171. Techniques of one variable calculus; limits; series; first order differential equations.

181 (209) [Z] Calculus Honors I 4 Same as Math 171. For selected students.

182 (210) Calculus Honors II 4 Same as Math 172. For selected students.

198 [Z] Mathematics Honors 3 Credit not granted for both Math 106 and Math 198.

201 [Z] Introduction to Finite Mathematics 3 Prereq 2 yrs high school algebra. Basic notions of logic, linear algebra, matrices, and analytic geometry; applications to linear programming.

202 Introduction to Mathematical Analysis 3 Prereq Math 107 or 201. Differential and integral calculus of the polynomial, exponential, and logarithmic functions.

220 Introductory Linear Algebra 3 Prereq Math 171. Elementary linear algebra with geometric applications.

230 Introductory Linear Algebra Honors 3 Same as Math 220. For selected students.

273 Calculus and Differential Equations 4 Prereq Math 172 and 220. Calculus of functions of several variables; linear differential equations.

283 Calculus Honors III 4 Same as Math 273. For selected students.

300 [Z] Foundations of Arithmetic 3 Prereq Math 105. The rational and real number systems; properties of prime numbers; fundamental theorem of arithmetic; interrelations of geometry and arithmetic.

303 Higher Geometry 3 Prereq Math 220. Geometry as a deductive system of logic, postulational systems; projective and non-Euclidean geometries.

320 Elementary Modern Algebra 3 Prereq Math 220. Algebra as a deductive system; number systems, groups, rings, and fields.


360 Elementary Probability Theory 3 Prereq Math 171 or 202. Probability based on set theory, binomial, normal, and Poisson distributions; expectation and variance; joint distributions and independence.

361 Elementary Statistical Inference 3 Prereq Math 360. Tests of hypotheses, estimation, nonparametric methods; regression analysis, least squares, chi-square methods.

364 Principles of Optimization 3 Prereq Math 202 or 220. Algebra of linear inequalities; duality; graphs, transport networks; linear programming; special algorithms; nonlinear programming; selected applications.


402 Theory of Numbers 3 Prereq Math 172, 220. Divisibility properties of integers; congruences; diophantine equations; quadratic residues.

410 Theory of Functions of a Complex Variable 3 Prereq Math 273. Cauchy's theorem; Taylor and Laurent series; calculus of residues; conformal mapping; special functions applied to engineering and physical sciences.


420 Abstract Algebra I 3 Prereq Math 273. Groups; elementary field properties; linear algebra.

421 Abstract Algebra II 3 Prereq Math 420. Properties of groups and group homomorphisms; commutative rings; integral domains; unique factorization domains; fields and field extensions.

425 Introductory Topology 3 Prereq Math 273. Sets, metric spaces, topological spaces, continuous mappings, compactness, connectedness, local properties, function spaces, and fundamental groups.

440 Applied Mathematics I 3 Prereq Math 273. Green's and Stoke's theorems; orthogonal functions; eigenvalue problems; Fourier series; applications involving partial differential equations and boundary value problems.

443  (441) Applied Probability 3 II Prereq Math 273. Probability and random variables; various probability distributions applied to engineering and science.

446  Numerical Methods in Matrix Calculus 3 I Prereq Cpt S 201; Math 202 or 220. Matrix calculus; linear equations and matrix inversion; eigenvalue and eigenvector problems.


460  Introduction to Probability and Statistics I 3 I Prereq Math 571. Basic concepts of probability theory; random variables; mathematical expectation; special distributions; regression theory; central limit theorem.

461  Introduction to Probability and Statistics II 3 II Prereq Math 460. Statistical inference; point and interval estimation; tests of hypotheses; t, F, and chi-square distribution.

464  Operations Research and Game Theory 3 II Prereq Math 371. Linear and integer programming; optimization problems; applications to economic and military strategies; rectangular games; minimax theory.

498  Undergraduate Research Seminar 2 May be repeated for credit.

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

500  Proseminar 1

502  Advanced Theory of Numbers 3 May be repeated for 6 hours credit. Prereq Math 402. Analytic and algebraic number theory.

510  Real Analysis I 3 I Prereq Math 372.

511  Real Analysis II 3 II Prereq Math 510.

512  Ordinary Differential Equations 3 Prereq Math 372. Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions.

515  (519) Complex Analysis I 3 Prereq Math 372.

516  Complex Analysis II 3 Prereq Math 515.

520  Modern Algebra I 3 Prereq Math 421. Topics in theories of groups, rings, modules, and fields; homological algebra; multilinear algebra; basic lattice theory.

521  Modern Algebra II 3 Prereq Math 520. Continuation of Math 520.

525  Topology I 3 Prereq Math 372, 421. General topology; homotopy; homology; manifolds.

526  (522) Topology II 3 Prereq Math 525. Continuation of Math 525.

527  Advanced General Topology 3 Prereq Math 526. Topology of uniform and proximity spaces; topics from convergence theory, function spaces, analytic topology.

539  Group Representation Theory and Applications 3 I Prereq Phys 402 or 406 or Chem 531; Math 420. Group theory, matrix groups, group representations, and selected application from physics and chemistry.


570  Functional Analysis 3 I Prereq Math 511. Topological linear spaces; spectral theory; Banach algebras.

581  Seminar in Analysis 3 May be repeated for 6 hours credit. I 1970-71 a/y.
82 Seminar in Algebra 3 May be repeated for 6 hours credit. I 1971-72 a/y.
83 Seminar in Applied Mathematics 3 May be repeated for 6 hours credit. II 1971-72 a/y.
84 Seminar in Topology and Geometry 3 May be repeated for 6 hours credit. II 1970-71 a/y.
85 Seminar in Number Theory 3 May be repeated for 6 hours credit. I 1971-72 a/y.
89 Special Problems 1-4 May be repeated for credit.

Astronomy

Astr
135 [P] Descriptive Astronomy 3 Physical characteristics and motions of the bodies of the solar system, stars, nebulae, and galaxies.


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

536 Celestial Mechanics 3 I 1971-72 a/y. Prereq Math 372. Two- and three-body problems; orbit determinations; theory of artificial satellites; dynamics of space exploration; perturbation; lunar and planetary theories.

537 Relativity Theory and Cosmology 3 I 1970-71 a/y. Prereq Math 372. Special and general relativity theory; tensor calculus; relativistic mechanics, electrodynamics, and thermodynamics; cosmological models.

538 Theoretical Astrophysics 3 I 1970-71 a/y. Prereq Math 372. Integral equations of radiative equilibrium; radiative equilibrium of extended atmospheres; White dwarf star theory; kinematics and dynamics of stellar systems.

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

Schedule of Studies

A major in mathematics requires Math 171, 172, 220, 273, 371, 372, 420, and 421, plus 12 hours of mathematics electives numbered above 300 (Math 460 and at least one of Math 440 and Math 364 are recommended electives); Cpt S 201; Phys 201, 202; Engl 201; and Fren, Ger, or Rus through 199 or 203.

Students contemplating graduate work in mathematics should give special consideration to Math 415 and 425 as electives.

For students with interests in the areas below, the indicated modifications in these requirements should be made:

Secondary education. Math 320 and 303 should be substituted for Math 420 and 421; Math 330; the requirements for a provisional teaching certificate with a teaching major in math must be met; the three semester language requirements may be waived; Phys 171, 172 may be substituted for Phys 201, 202; Cpt S 200 may be substituted for Cpt S 201.

Computer Science. Math 320 and 446 may be substituted for Math 420 and 421. Additional recommendations: two courses from Math 364, 440, 441, 464; Math 460; Math 447; Cpt S 310, 315, 401; E E 414.

Applied Mathematics. Math 320 and 446 may be substituted for Math 420 and 421. Additional recommendations: Math 440, 441 or Math 364, 464; Math 410; Math 447; Math 460; Cpt S 310; a year's course in depth in an appropriate applied area (usually outside of the mathematics department).

Probability and Statistics. Math 415, 460, and 461 are recommended as well as some electives in applied statistics from other departments (e.g., B A 412 or 415, Biom 420).

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 the Doctor of Philosophy degree should contact the department for advice and assistance in the development of their plans.
Department of Mechanical Engineering


Mechanical engineering is a profession of wide scope, occupied with design and manufacture of a vast array of products and systems required by our industrial society. The curriculum is arranged to provide the basic knowledge of science and engineering necessary for entrance into the profession.

The products of industry range from small, intricate devices to very large, complex systems. The mechanical engineer provides an essential service both to industry and to the individual consumer.

While the mechanical engineer is engaged in the continuous development and improvement of conventional machines and equipment, he is also alert to the possibility of creating new products that evolve from our rapidly expanding technology. Some of the recent developments in the field of mechanical engineering are supersonic aircraft, jet and rocket engines, computer systems, space ships, nuclear power plants, high-speed rail cars, and automated machines.

Although many mechanical engineers are engaged in research, design, development, and production, there are excellent opportunities available to them in the important fields of sales, operations, and services.

This curricula is accredited by the Engineers Council for Professional Development.

The department offers courses of study leading to the degrees of Bachelor of Science in Mechanical Engineering and Master of Science in Mechanical Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy (Engineering Science).

Description of Courses

M E For explanation see Index under "Symbols"

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.

110 Mechanical Engineering Orientation 1 Professional ideals and ethics in engineering; discussions on the profession, methods, and procedures for elementary calculations.

203 Metals Processing 1 (0-3) Prereq M E 101. Operation of basic machine tools used in industry; welding processes.

210 Materials and Processes 3 I Prereq M E 101; Math 171. Properties and applications of basic engineering materials; methods of processing, including metal cutting and fabrication practices.

211 Laboratory I 2 (0-6) Prereq M E 210 or c/. Basic metal processing techniques used in industry and their microscopic and macroscopic effects on the material processed.

224 Mechanical Equipment 3 Not open to engineers. The mechanical aspects of heating, ventilation, refrigeration, and air conditioning.

301 Thermodynamics 3 Prereq Math 273 or c/; Phys 201. Thermodynamic properties of matter; the first and second laws.

302 (304) Thermodynamics 3 II Prereq M E 301. Nonreactive and reactive mixtures, cycles, and system components.

303 (302) Fluid Dynamics 3 II Prereq M E 301. Laminar and turbulent flow of ideal and viscous fluids; pipe flow, boundary layers, wing theory; supersonic flow: nozzles, shock waves.

305 Laboratory II 1 (0-3) II Prereq M E 302 or 303 or c/. Experiments related to principles of compressible and incompressible fluids, thermodynamics, and thermodynamic cycle components.

312 (311) Mechanics of Machinery 3 (1-6) I Prereq C E 212. Transfer of motion; velocity, acceleration, and inertia forces in machines; static and dynamic force systems.

313 (321) Dynamic Analysis 3 (2-3) II Prereq M E 312. Dynamic analysis of physical systems; elements of mechanical vibration and control systems; analog computer simulation of dynamic systems.

Air Conditioning 3 I Prereq Phys 102. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

320 (342) Materials Laboratory 1 (0-3) Prereq C E 314 or c/f. Mechanical behavior of materials and application to engineering structures.

326 Heat Transfer and Compressible Fluid Flow 3 Prereq M E 301.


406 (422) Laboratory III 2 (0-6) I Prereq M E 305, 321; M E 404 or c/f. Investigations involving solid-body mechanics, heat transfer, and fluid mechanics.

415 Mechanical Design II 3 I Prereq C E 314. Influence of behavior of materials on the design and production of machine elements.

416 (425) Design of Engineering Systems 3 (1-6) II Prereq M E 302, 404, 415. Selected projects in system design including thermal sciences and mechanical equipment aspects.

424 Production Engineering 3 II Prereq M E 415. Production methods and techniques, including production design, tool design, cutting force analysis, and production costs.

435 (407) Thermal Systems 3 I Prereq M E 302. Thermal systems currently applicable to power generation.

436 Propulsion Systems 3 II Prereq M E 302. Thermodynamic and compressible-flow principles applied to the design and analysis of propulsion systems for aircraft and space vehicles.

439 Aerodynamics 3 II Prereq C E 315 or M E 303. Theory of ideal fluids; circulation; irrotational flow; thin and finite airfoil theory; conformal transformations.


450 Kinematics 3 II Prereq M E 312. Mathematical and graphical techniques applied to the analysis and synthesis of mechanisms.

451 Control Systems 3 I Prereq M E 313. Theory and design of control systems using frequency and root-locus methods.

498 Seminar 1 Prereq senior in M E.

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

536 Advanced Thermodynamics 3 Laws and applications to simple systems and to flow processes; fluid properties and characteristic equations; energy conversion.

537 Statistical Thermodynamics 3 Methods of statistical mechanics and molecular transport theory; evaluation of properties of gases from molecular data.

540 Mechanics of Compressible Fluids 3 Dynamics and thermodynamics of inviscid, ideal gas flows with emphasis upon shock phenomena, and two-dimensional flows.

541 Theory of Real Fluids 3 Mechanics of viscous fluid flows, including boundary layer theory.

545 Heat Transfer I 2 Steady-state and transient heat conduction.

546 Heat Transfer II 3 Laminar and turbulent forced convection heat transfer for internal and external flows; free convection; heat exchanger analysis.

547 Heat Transfer III 2 The basic characteristics of thermal radiation; radiant interchange among surfaces; radiation in absorbing-emitting gases; combined modes of heat transfer.

554 Elasticity 3 Modern theory of elasticity; Airy stress function; energy principles.

555 Experimental Stress Analysis 3 Theory and application of the modern approach to experimental elasticity.

556 Advanced Mechanical Vibrations 3 Nonlinear systems; transient response; Lagrange's equations.

557 Advanced Dynamics 3 Introduction to classical mechanics; elastic wave propagation theory.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 53 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>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>Bio S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

198
second Semester
En 105 Principles 4
Math 172 Calculus II 4
Pt 201 Computer Prog 2
E E 102 Desc Geom 2
E E 110 Orientation 1
Um or Soc S Elective 3
OTC or Elective 2
E 1/2

Sophomore Year
first Semester
Math 220 Intro Linear Algebra 3
Phys 201 Classical Phys 4
Chem 102 Fundamentals 3
E E 211 Statics 3
E E 210 Materials and Processes 2
OTC or Elective 2
E 1/2

second Semester
Math 273 Calc and Diff Eqns 4
Phys 202 Classical Phys 4
E E 212 Dynamics 3
E E 211 Laboratory I 2
Soc S Elective 3
OTC or Elective 2
E 1/2

Junior Year
first Semester
E E 314 Mech of Materials 3
Chem 301 Materials Science 3
Math 301 Thermodynamics 3
E E 312 Mech of Machinary 3
E E 320 Materials Lab 1
Math or Cpt S Elective 3

second Semester
Math 302 Thermodynamics 3
Math 303 Fluid Dynamics 3
E E 305 Laboratory II 1
E E 313 Dynamic Analysis 3
E E 314 Mechanical Design I 3
Hum Elective 3

Senior Year
first Semester
E E 261 E E Science 3
E E 262 E E Laboratory 1
M E 404 Heat Transfer 3
M E 406 Laboratory III 2
M E 415 Mechanical Design II 3
M E 498 Seminar 1
M E Elective 3

second Semester
M E 416 Design of Engr Systems 3
M E Elective 3
Engr or Science Elective 6-7
Soc S Elective 3

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

Transfer Students
Students who are planning to transfer from other institutions (except those institutions accredited by ECPD) to Washington State University should plan on spending a minimum of three years at Washington State to earn 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.

Preparation for Graduate Study
Before undertaking graduate study, a student should have completed substantially the equivalent of the above schedule of studies.

Department of Metallurgy

Professor and Chairman of the Department, S. A. Duran; Professors, D. B. Masson, R. A. V. Raff; Adjunct Professor, S. H. Bush; Associate Professors, R. M. Horton, R. F. Tindel; Assistant Professor, E. C. Muehleisen.

The department offers a fundamental program in materials science with courses in six subject areas: (1) structural nature of materials, (2) thermodynamics and phase equilibrium, (3) phase transformations and solid state reactions, (4) deformation of solids, (5) physical properties of materials, and (6) chemical properties of materials.

Metallurgy is the science and engineering of metals. Physical metallurgy deals with the nature and properties of metals as engineering materials. In the undergraduate program, the student is introduced to physical metallurgy through the broad concepts of materials science, as applicable to non-metallic materials as to metals. Graduate studies provide the opportunity for pursuing original investigations in a variety of fields.

The curriculum in physical metallurgy in the College of Engineering is accredited by the Engineers Council for Professional Development.

The department offers courses leading to the degrees of Bachelor of Science in Physical Metallurgy and Master of Science in Materials Science. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy (Engineering Science).
## Description of Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met 110</td>
<td>Metallurgy 2</td>
<td>For freshmen only. Engineering, metallurgy, and physical metallurgy; materials science; calculation and presentation of engineering data.</td>
<td></td>
</tr>
<tr>
<td>220</td>
<td>Metallography (0-9)</td>
<td>I 1970-71</td>
<td>Principles and techniques of optical metallography and other laboratory methods used in modern physical metallurgy.</td>
</tr>
<tr>
<td>301</td>
<td>Materials Science</td>
<td>3 I Prereq Chem 105; Math 172; Phys 202</td>
<td>Structure of materials, phase equilibrium, phase transformations, and mechanical properties.</td>
</tr>
<tr>
<td>302</td>
<td>Materials Science</td>
<td>3 I Prereq Chem 105; Math 172; Phys 202</td>
<td>Structure of materials; phase equilibrium, transformations; electronic structure of solids; thermal, electrical, and magnetic properties of materials; semiconductors, dielectrics.</td>
</tr>
<tr>
<td>313</td>
<td>Mechanics of Solids</td>
<td>3 II Prereq C E 211 or 1 sem mechanics; Met 301</td>
<td>Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory; creep, fracture, fatigue; internal friction.</td>
</tr>
<tr>
<td>321</td>
<td>X-Ray Diffraction</td>
<td>3 II Prereq Phys 202</td>
<td>Properties of X rays, scattering and diffraction; space lattices and groups; projections; diffraction methods; structure determination; X-ray spectroscopy.</td>
</tr>
<tr>
<td>323</td>
<td>X-Ray Diffraction Laboratory</td>
<td>1 (0-3) II Prereq c// in Met 321</td>
<td>X-ray diffraction techniques; interpretation of diffraction data from single crystals and polycrystals.</td>
</tr>
<tr>
<td>402</td>
<td>Polymeric Materials</td>
<td>3 II 1971-72</td>
<td>a/y. Prereq Met 301 or junior standing in Engr or Ph S. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.</td>
</tr>
<tr>
<td>403</td>
<td>Ceramic Materials</td>
<td>3 II 1971-72</td>
<td>a/y. Prereq Met 301. Processing, characteristics, microstructure, and properties of ceramic materials.</td>
</tr>
<tr>
<td>414</td>
<td>Thermodynamics and Phase Equilibrium</td>
<td>4 I Prereq Chem 332; Met 301</td>
<td>Concepts of activity, equilibrium, partial molal quantities; relationship between free energy, composition, and temperature; heterogeneous equilibria; ternary and multicomponent systems.</td>
</tr>
<tr>
<td>415</td>
<td>Physical Properties</td>
<td>3 I Prereq Chem 332; Met 301, 321</td>
<td>Introduction to free-electron and band theories of solids; theory of alloys, cohesion; thermal, electrical, and magnetic behavior of materials.</td>
</tr>
<tr>
<td>416</td>
<td>Solid State Reactions</td>
<td>3 II Prereq Chem 332; Met 321, 414</td>
<td>Thermodynamics of solid phases; mechanisms and kinetics of diffusion; nucleation and growth; recrystallization; boundary migration; eutectoid and martensitic transformations.</td>
</tr>
<tr>
<td>418</td>
<td>Chemical Properties</td>
<td>3 II 1970-71</td>
<td>a/y. Prereq Chem 332 or c//; Met 301. Thermodynamics and kinetics of heterogeneous chemical reactions at metallic surfaces: oxidation and other gas-metal reactions; electrolysis; corrosion.</td>
</tr>
<tr>
<td>425</td>
<td>Physical Metallurgy Laboratory</td>
<td>2 (0-6) I Prereq Met 313; c// in Met 414</td>
<td>Experimental studies based on deformation behavior of solids and phase equilibrium.</td>
</tr>
<tr>
<td>426</td>
<td>Physical Metallurgy Laboratory</td>
<td>2 (0-6) II Prereq c// in Met 416</td>
<td>Experimental techniques of physical metallurgy applied to study of solid state reactions.</td>
</tr>
<tr>
<td>450</td>
<td>Seminar</td>
<td>1</td>
<td>May be repeated for credit. Prereq senior standing.</td>
</tr>
<tr>
<td>499</td>
<td>Special Problems</td>
<td>1-4</td>
<td>May be repeated for credit.</td>
</tr>
<tr>
<td>511</td>
<td>Dislocations and Deformation</td>
<td>3 I Prereq Met 301; Met 313 or C E 314</td>
<td>Elementary dislocation theory and its applications to some important deformation processes.</td>
</tr>
<tr>
<td>512</td>
<td>Theory of Metals</td>
<td>3 II 1970-71</td>
<td>a/y. Current models of metals; theories of metallic bonding; theories of alloy phases.</td>
</tr>
</tbody>
</table>
### Schedule of Studies

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

#### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Met 110 Metallurgy</td>
<td>2</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 172 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>Math 220 Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Chem 106 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Bio S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 273 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>Cpt S 201 Intro Comp Prog</td>
<td>2</td>
</tr>
<tr>
<td>Phys 201 Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Chem 217 or 240</td>
<td>4</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

#### Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Elective</td>
<td>3</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>Econ 102 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chem 331 Physical</td>
<td>4</td>
</tr>
<tr>
<td>Met 301 Materials Sci</td>
<td>3</td>
</tr>
<tr>
<td>Met 220 Metallography</td>
<td>3</td>
</tr>
<tr>
<td>Met 351 Process Met</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 332 Physical</td>
<td>3</td>
</tr>
<tr>
<td>Chem 333 Physical Lab</td>
<td>1</td>
</tr>
<tr>
<td>Met 313 Mech Solids</td>
<td>3</td>
</tr>
<tr>
<td>Met 321 X-ray Diffrac</td>
<td>3</td>
</tr>
<tr>
<td>Met 323 X-ray Diffrac Lab</td>
<td>1</td>
</tr>
<tr>
<td>Met 332 Metallic Materials</td>
<td>3</td>
</tr>
<tr>
<td>Met 403 Ceramic Mats</td>
<td>3</td>
</tr>
</tbody>
</table>
Courses of Instruction

The purpose of the Army ROTC program is to develop in college students the skills and attributes of character which will enable them to accept responsible positions of leadership both as citizens and as Army officers.

The military science curriculum is divided into two phases, Basic and Advanced. The basic phase consists of four courses and is normally completed on campus during the freshman and sophomore years. Students who are unable to take these courses at this time may qualify for entry into the advanced phase by completing Mil S 250. Students who have successfully completed the basic course may enroll in the advanced courses upon approval. These students must agree to accept a commission if offered, and to serve on active duty for two years if commissioned. While enrolled in the advanced course the cadets will be paid a retainer fee of $50.00 per month for not more than 20 months. Training is in General Military Science so that upon graduation the student is qualified for commission in any of the 14 branches of the Army.

Commissions
To qualify for a commission a student must successfully complete the advanced course and graduate from the university. Nearly all cadets who rank in the upper one third of their ROTC class are eligible to receive commissions in the Regular Army. Officers who are pursuing advanced degrees are normally deferred from active duty until they have completed their studies.

Flight Training
Army ROTC offers free voluntary flight training to selected seniors who meet the physical qualifications. This training qualifies the cadet for a private FAA pilot’s license. Acceptance of this training increases the cadet’s active duty obligation to three years.

Description of Courses
For explanation see Index under "Symbols"

Basic

Mil S
101 Weaponry 2 (2-1) I Weaponry, marksmanship, and school of the soldier.
102 National Security 2 (2-1) II Organization of the Army and ROTC, U.S. Army, national security, and dismounted drill.
201 Military History 2 (2-1) I Prereq Mil S 102. Development of U.S. Army 1775 to present; dismounted drill and exercise of command.

202 Tactics 2 (2-1) II Prereq Mil S 102. Maps and aerial photographs, squad tactics, dismounted drill, and exercise of command.

250 Basic Summer Camp 4 S Prereq 2 yrs college. A six-week course of intensive military training which can be substituted for Mil S 101, 102, 201, and 202. Successful completion qualifies students for enrollment in advanced military science.

Advanced

Mil S

301 Leadership 3 (4-1) I Prereq Mil S 202 or 250. Leadership principles and techniques, military teaching principles, presentation of instruction, exercise of command, and leadership.

302 Advanced Tactics 3 (4-1) II Prereq Mil S 202 or 250. Small-unit tactics and communications, precamp orientation, counter-insurgency, physical conditioning, and leadership.

350 Advanced Summer Camp 4 S Prereq 1 yr advanced course. A six-week course in military tactics, command, and leadership.

401 Staff and Operations 3 (4-1) I Prereq Mil S 302. Staff procedures, logistics, exercise of command, and leadership.

402 Staff and Administration 3 (4-1) II Prereq Mil S 302. Army administration, military law, role of U.S. in world affairs, service orientation, exercise of command, and leadership.

Department of Music of the School of Music and Fine Arts


The objectives of the Department of Music are twofold: culturally, to teach musical skills, attitudes, knowledges, and appreciation that, in combination with the other arts and humanities, contribute to an enriched life; professionally, to prepare teachers and musicians who, in addition to the above, are proficient in and capable of professional leadership.

Options I and II in either bachelor's degree lead to professional careers in music as performers, teachers, directors, and avocational music leaders. These curricula are preparatory to graduate work for the degree of Master of Arts in Music. Option III leads primarily to certification for teaching in the public schools of Washington. Students wishing certification in other states will be guided accordingly.

All certified or declared music majors are required to study piano until the proficiency examination has been passed.

The Department of Music is a member of the National Association of Schools of Music. The department offers courses of study leading to the degrees of Bachelor of Arts in Music, Bachelor of Music, Master of Arts in Music, and Master of Arts in the Teaching of Music.

Description of Courses

Private Lessons in Music

No additional fees or tuition are charged for private lesson instruction or the use of practice rooms. Private lesson credit is based on the number of 30-minute lessons per week. One lesson per week usually gives 2 hours of credit; 2 lessons per week 3 hours of credit. Courses for 1 semester hour of credit are open to music majors for study in a secondary applied field at the discretion of the teacher and chairman of the department. Practice facilities are arranged during the first week of the semester. All students taking private lessons are required to attend weekly recitals.

The 100-level of private lessons, elementary, denotes the lowest level of private lessons for which college credit can be given. Students at the 200-level, intermediate, must appear on the weekly student convocation at least once during the academic year. Students at the 300-level, junior, are ready to present a half-recital in public, and students in the 400-level, senior, are ready to present a full public recital. Students in the 500-level, graduate, are capable of presenting a full public recital at the graduate level. Placement in private lessons is based on an audition in the music department during registration. All applied music numbers for private lessons may be repeated for credit.

Complete descriptions of each of the courses
The department offers courses in operatic workshop, chorus, and choral conducting. Participation in musical organizations is required each semester. Not more than 8 hours of credit in performing groups is allowed toward graduation.

**Music Performing Groups**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 228, 428</td>
<td>(154) Opera Workshop 1 3 rehearsals a week. May be repeated for 8 hours credit. Fundamentals in operatic performance.</td>
<td>1-3</td>
<td>Open to students wishing to participate in choral singing. Usually one public appearance each semester.</td>
</tr>
<tr>
<td>Mus 229, 429</td>
<td>(111) Chorus 1 3 rehearsals a week. May be repeated for 8 hours credit. Open to students by audition. Public performances each semester.</td>
<td>1-3</td>
<td></td>
</tr>
<tr>
<td>Mus 231, 431</td>
<td>(121) Choir 1 3 rehearsals a week. May be repeated for 8 hours credit. Open to students by audition. Public performances each semester.</td>
<td>1-3</td>
<td></td>
</tr>
</tbody>
</table>

**Musical Theory**

Mus 151 Rudiments of Music 2 I Notation, intervals, scales, chords, coordinated with singing.

Mus 152 Rudiments of Music 2 II Continuation of Mus 151.

Mus 251 Materials and Structures of Music 2 I Prereq Mus 151 or by examination. Continuation of Mus 152.

Mus 252 Applied Skills 1 (0-3) I Prereq Mus
132 or by examination; c// in Mus 251. Ear training, sight singing, keyboard.

253 Materials and Structures of Music 2 I Prereq Mus 251. Continuation of Mus 251.

254 Applied Skills 1 (0-3) II Prereq Mus 252; c// in Mus 253. Continuation of Mus 252.

351 Materials and Structures of Music 3 (2-3) I Prereq Mus 253 and 254. Intermediate study of temporal, linear, and vertical relationships; score reading, forms, counterpoint, analytical techniques, and laboratory.

352 Materials and Structures of Music 3 (2-3) II Prereq Mus 351. Continuation of Mus 351.


452 (464) Tonal Counterpoint 2 or 3 I 1970-71 a/y. Prereq Mus 352. Contrapuntal techniques of the early 18th century with original writing in the style.

453 (466) Form and Analysis 2 II 1970-71 a/y. Prereq Mus 352. Musical structures, including analysis and original writing.


455 (467) Seminar in Orchestration 3 May be repeated for credit. Prereq Mus 352. Scoring for various instrumental combinations.

456 (468) Seminar in Composition 2 or 3 May be repeated for credit. Advanced writing techniques with emphasis upon individual development.

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

551 Theory of Piano Tuning 3 S Prereq Mus 352; 27 additional hrs Mus. Physical basis for setting various temperaments; piano mechanism.


553 (561) Seminar in Music Theory 2 May be repeated for 4 hours credit. I Prereq Mus 352.

History and Literature

Mus

160 (107) [H] Survey of Music Literature

3 Listening from the humanistic point of view.

161 (209) Introduction to Music Literature 3 For majors only.

162 (108) [H] Introduction to Opera 2 Music and texts of standard opera literature.

263 (309) [H] Music to 1750 3 (2-3) I The development of ideas and styles through the Baroque period.

264 (310) [H] Music from 1750 to 1900 3 (2-3) II The development of ideas and styles from the classic period to the 20th century.


464 Colloquium in Music 2 I Developing a critical attitude toward the composition and performance of music of all periods; aesthetic success, style, and performance.

465 The Medieval and Renaissance Periods 2 II 1971-72 a/y. Development of ideas and styles in Western European music from 700 to 1600.

466 (478) Survey of Song Literature 2 II 1971-72 a/y. Prereq Mus 160 or 164. The 17th century to the present; historical and philosophical trends of the periods.


483 Ensemble Conducting 1 (0-3) II Prereq Mus 482.

484 Ensemble Conducting 1 (0-3) II Same as Mus 483.

561 (509) Seminar in Music History 2 May be repeated for 4 hours credit. Prereq Mus 263 or 264.

562 (510) Symphonic Literature 2 I Symphony orchestra and symphonic form from its beginning to modern times studied from the score.

563 Chamber Music Literature 2 The concept and development of chamber music; study of major works.

564 (511) Opera Literature 2 II 1970-71 a/y. Literature and concepts of opera from 1600 to the present.


575 Advanced Conducting 2 or 3 May be repeated for credit. S Prereq Mus 375. Orchestras, bands, and choruses.
Special Problems 1-4 May be repeated for credit.
Research, Thesis, or Examination Variable credit.

Music Education

Mus

181 (222) Class Piano I 1 (0-3) I Majors, minors, and Elem Educ majors only. Beginning class in piano.
182 Class Piano II 1 (0-3) Continuation of Mus 181.
183 Class Piano III 1 (0-3) Continuation of Mus 182.
184 (216) Fundamental Brass Techniques 1 (0-3) Majors and minors only. Beginning class in brass.
185 (217) Fundamental String Techniques 1 (0-3) Majors and minors only. Beginning class in strings.
186 (218) Fundamental Voice Techniques 1 (0-3) Majors, minors, and Elem Educ majors only. Beginning class in voice.
187 (219) Fundamental Woodwind Techniques 1 (0-3) Majors and minors only. Beginning class in woodwinds.
188 (220) Fundamental Percussion Techniques 1 (0-3) II Majors and minors only. Beginning class in percussion.
189 Fundamental Percussion Techniques 1 (0-3) Same as Mus 386.
190 (221) Choral Program 2 (1-3) I Majors, minors, and Elem Educ majors only. Choral organizations, auditions, placement, intonation, balance, blend, diction, phrasing, style; materials and conducting.
191 (371) Materials and Methods for Classroom Teachers 3 Prereq Educ 201. Techniques in singing, listening, reading, rhythmic, and creative activities.
192 Music Education 3 I Philosophies, administration, organization, materials, and methods.
193 (375) Instrumental Conducting 1 (0-3) I Score reading, clefs, transposition, aural training, rehearsal techniques, ensemble seating, and programming.
194 (376) Piano Pedagogy 1 May be repeated for credit. Prereq Mus 202. Materials and methods of teaching experiences.
195 Teaching Elementary School Music 2 or 3 Prereq Mus 390 or 480. Problems of instruction, supervision, and administration.
196 Graduate Recital 2 May be repeated for 4 hours credit.

581 (524) Instructional Procedures in Brass Instruments 2 or 3 Prereq Mus 381. Playing, teaching, and choice of materials for cornet, French horn, trombone, baritone, and tuba.
582 (521) Instructional Procedures in String Instruments 2 or 3 Prereq Mus 381. Problems in playing, teaching, and choice of materials for violin, viola, cello, and string bass.
583 (523) Instructional Procedures in Voice 2 or 3 Voice production, teaching, and choice of materials.
584 (522) Instructional Procedures in Woodwind Instruments 2 or 3 Prereq Mus 384. Playing, teaching, and choice of materials for flute, oboe, clarinet, bassoon, and saxophone.
585 (525) Instructional Procedures in Percussion Instruments 2 or 3 Playing, teaching, and choice of materials for drums, cymbals, timpani, and all special percussion effects.
586 (579) Instructional Procedures in Choral Music 2 or 3 Prereq Mus 351 and experience in chorus or choir. Choral organizations, principles, and techniques of singing; diction, intonation, quality, balance, blend, phrasing, style, and tone color; examination of materials.
590 (574) Music Education 2 or 3 Problems of instruction, supervision, and administration.
591 (578) Instrumental Ensemble Techniques 2 or 3 May be repeated for 6 hours credit. Instrumental programs in public schools; class instruction, rehearsal routines, program building, and examination of materials.

Schedule of Studies

Bachelor of Arts in Music—Four-Year Curriculum

At least 26 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester  

Hours
Engl 101 Composition  
3
Mus 251, 253  
3
Private Lessons  
2-3
Music Perform Groups  
1-2
General Univ Requirements  
6
ROTC or Elective  
2
P E  
1/2
hours in another applied field. Candidate must appear in a junior recital and present a full senior recital. All piano majors are expected to accompany at least one recital during their sophomore or junior year.

**Option II—Voice**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 389 or 482 and 483 or 484</td>
<td>2</td>
</tr>
<tr>
<td>Mus 451 or 452; 453 or 454</td>
<td>4</td>
</tr>
<tr>
<td>Private Lessons (voice)</td>
<td>6</td>
</tr>
<tr>
<td>Private Lessons (piano)</td>
<td>4</td>
</tr>
<tr>
<td>Mus 466 Survey of Song Literature</td>
<td>2</td>
</tr>
<tr>
<td>Mus 162 Introduction to Opera</td>
<td>2</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>8</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>12</td>
</tr>
</tbody>
</table>

Private lessons must include 24 hours of voice. Candidate must appear in a junior recital and present a full senior recital.

**Option III—Music Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 480, 490</td>
<td>2-3</td>
</tr>
<tr>
<td>Mus 381, 382, 383, 384; 386 or 387</td>
<td>5</td>
</tr>
<tr>
<td>Mus 482 Instrumental Conducting</td>
<td>1</td>
</tr>
<tr>
<td>Mus 389 Choral Program</td>
<td>2</td>
</tr>
<tr>
<td>Mus 181, 182, 183</td>
<td>3</td>
</tr>
<tr>
<td>Educ 101, 201, 301, 401 or 402, 403 or 404, 405 or 406</td>
<td>24</td>
</tr>
<tr>
<td>Psych 101 Principles of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>11</td>
</tr>
</tbody>
</table>

**Schedule of Studies**

**Bachelor of Music—Five-Year Curriculum**

At least 34 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

**First Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Mus 251, 252</td>
<td>3</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select from Chosen Option</td>
<td>15</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>15</td>
</tr>
</tbody>
</table>

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

**Option I—Brass, Organ, Piano, Strings, and Woodwinds**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 389 or 482 and 483 or 484</td>
<td>2</td>
</tr>
<tr>
<td>Mus 451 or 452; 453 or 454</td>
<td>4</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>10</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>14</td>
</tr>
</tbody>
</table>

Electives must include Mus 486 and 467 for piano majors. Private lessons must include 24 hours on major instrument and 4
Second Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 351 Mat and Structures</td>
<td>3</td>
</tr>
<tr>
<td>Mus 264 Mus to 1750</td>
<td>3</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>3-4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

P E                                         1/2

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 352 Mat and Structures</td>
<td>3</td>
</tr>
<tr>
<td>Mus 263 Mus 1750-1900</td>
<td>3</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>2</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>3-4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

P E                                         1/2

Third Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Lessons</td>
<td>3</td>
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<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>6</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>6</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 482; 483 or 484</td>
<td>4</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>3</td>
</tr>
</tbody>
</table>

Fourth Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>3</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>9</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Lessons</td>
<td>3</td>
</tr>
<tr>
<td>Music Perform Groups</td>
<td>1-2</td>
</tr>
<tr>
<td>Select from Chosen Option</td>
<td>12</td>
</tr>
</tbody>
</table>

Fifth Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select from Chosen Option</td>
<td>16</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select from Chosen Option</td>
<td>16</td>
</tr>
</tbody>
</table>

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

Option I—Brass, Organ, Piano, Strings, and Woodwinds

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 389 or 482 and 483 or 484</td>
<td>2</td>
</tr>
<tr>
<td>Mus 451 or 452, 453 or 454, 455, 456</td>
<td>10</td>
</tr>
<tr>
<td>Private Lessons (supporting area)</td>
<td>6</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>8</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>6</td>
</tr>
</tbody>
</table>

Electives must include Mus 486 and 467 for piano majors. Private lessons in basic curriculum must include 24 hours on major instrument. Candidate must appear in a junior recital and present a full senior recital. Piano majors are expected to accompany at least one recital during their sophomore or junior year. Credit in music performing groups must include at least 1 hour in Mus 149-154.

Option II—Voice

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 389, 432, 453, 466</td>
<td>8</td>
</tr>
<tr>
<td>Private Lessons (supporting area)</td>
<td>6</td>
</tr>
<tr>
<td>Foreign Lang (include Fren and Ger)</td>
<td>16</td>
</tr>
<tr>
<td>Mus 162 Introduction to Opera</td>
<td>2</td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>4</td>
</tr>
</tbody>
</table>

Credit in music performing groups must include at least 2 hours in Mus 228. Private lessons in basic curriculum must include 24 hours of voice. Candidate must appear in a junior recital and present a full senior recital.

Option III—Music Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mus 452, 453, 455</td>
<td>7</td>
</tr>
<tr>
<td>Mus 480 or 490</td>
<td>2-3</td>
</tr>
<tr>
<td>Mus 389 Choral Program</td>
<td>2</td>
</tr>
<tr>
<td>Mus 381, 382, 383, 384, 386 or 387</td>
<td>5</td>
</tr>
<tr>
<td>Educ 101, 201, 301, 401 or 402, 403</td>
<td>24</td>
</tr>
<tr>
<td>or 404, 405 or 406</td>
<td></td>
</tr>
<tr>
<td>General Univ Requirements</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 Principles of Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

Private lessons in basic curriculum must include 15 hours in the major applied area and 9 hours in supporting areas as well as 5 hours of voice.

Students who are interested in a theory and composition concentration should include in their curriculum Mus 451, 452, 453, 454, 455, and 16 hours of Mus 456.

Preparation for Graduate Study

Students with undergraduate majors in such subjects as music and music education may be well prepared for graduate study in this department.

Undergraduate students who are pursuing their studies at other institutions or through other curricula at this institution will do well to elect courses similar to those required in the above schedules of studies.
Program in Nuclear Technology

Larry Stern, Adviser.

The graduate program leading to the Master of Science degree in Nuclear Technology at Washington State University has been developed to train qualified people in the field of nuclear engineering and to stimulate research in this and closely related areas of science and engineering.

The program of study is characterized by interdisciplinary education in science and engineering. Graduate students in nuclear technology will be required to take course work representing a wider scope of science and engineering than is usually found in a program offered by a single department.

The Program

A recognized bachelor's degree in engineering, physics, chemistry, metallurgy, or mathematics is required. The program will consist of core courses selected from the following list and supporting courses as approved by the program committee. (A thesis is required. Foreign language is not required.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch E 316*</td>
<td>Reactor Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Ch E 414</td>
<td>Introduction to Nuclear Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Ch E 503</td>
<td>Heat Transmission</td>
<td>3</td>
</tr>
<tr>
<td>Ch E 514</td>
<td>Nuclear Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Ch E 516</td>
<td>Nuclear Engineering Lab</td>
<td>2</td>
</tr>
<tr>
<td>Ch E 600</td>
<td>Research, Thesis, or Examination</td>
<td>4</td>
</tr>
<tr>
<td>Chem 305*</td>
<td>Introduction to Radiochemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 405</td>
<td>Nuclear Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>C E 547</td>
<td>Radiological Health</td>
<td>3</td>
</tr>
<tr>
<td>C E 549</td>
<td>Radiation Protection</td>
<td>4</td>
</tr>
<tr>
<td>C E 588</td>
<td>Radiological Waste</td>
<td>3</td>
</tr>
<tr>
<td>Phys 412</td>
<td>Nuclear Instruments</td>
<td>2</td>
</tr>
<tr>
<td>Phys 465</td>
<td>Introduction to Nuclear Physics</td>
<td>2</td>
</tr>
<tr>
<td>Ph S 347*</td>
<td>Radiation Protection</td>
<td>2</td>
</tr>
</tbody>
</table>

*Graduate credit for 300-level courses is granted to majors in nuclear technology only by special permission.

Program in Nursing

Center for Nursing Education in Spokane

Associate Professor and Director of Nursing, Hilda B. Roberts; Assistant Professors, Betty M. Anderson, Flora E. Green, Gail A. Johns, Helen M. McKimlay, Ilia A. Olson.

Pullman Campus

Instructor and Advisor, Lucilla W. McCluskey; Instructor, Margaret K. Ritzheimer.

The curriculum in nursing, open to men and women, is designed for two types of students—those with no previous preparation in nursing or registered nurses and graduates of a hospital or community college school of nursing.

The curriculum is four academic years plus one summer session for the student with no previous preparation in nursing. The length of the program for the registered nurse will vary depending on previous education and the course load carried while at the university.

Education for professional nursing provides the student with a foundation in the biological, physical, and social sciences and in the humanities. This broad educational experience helps nursing students acquire the knowledge, skills, and understanding necessary to function as professional nurses. The goal of the program is to prepare its graduates in any field of nursing, including public health, and to assume leadership roles. The program is also designed to provide a foundation for graduate study on the master's level in specialized clinical areas, teaching, research, and administration.

Washington State University is one of four institutions participating in the cooperative interinstitutional program in baccalaureate nursing education in eastern Washington.

The lower-division program consists of the freshman and sophomore years on the campus in Pullman in general education courses. The upper-division courses in the nursing major and related courses are offered at the Intercollegiate Center for Nursing Education in Spokane and begin with the summer session following the sophomore year. Excellent hospitals and community health agencies in the Spokane area are used for the clinical experience.

The program is accredited by the Washington State Board of Nursing. Upon successful completion of the baccalaureate program, graduates are eligible to take the state examination for licensure as Registered Nurses.
The program offers a course of study leading to the degree of Bachelor of Science in Nursing.

**Description of Courses**

**Nurs** For explanation see Index under "Symbols"

101 Introduction to Nursing 3 Appreciation and understanding of professional nursing, educational preparation, functions, and opportunities.

121 Home Nursing and Community Health 2 (1-3) Nursing in the home, including mother and baby care; orientation to community health services; civil defense preparedness.

300 Basic Nursing 4 (2-6) S Prereq Zool 251. Clinical nursing; scientific principles and skills required in comprehensive nursing care of individuals.

310 Medical-Surgical Nursing 4 Prereq junior in Nurs. Adults undergoing the stress of acute and chronic medical-surgical disease; problem-solving process.

311 Medical-Surgical Nursing Practicum 5 (0-15) Prereq junior in Nurs. Guided experiences in observing and caring for individuals with medical-surgical problems.

320 Maternal-Child Nursing 4 Prereq junior in Nurs. Family-centered approach to the study of child bearing and child rearing periods of the life cycle.

321 Maternal-Child Nursing Practicum 5 (0-15) Prereq junior in Nurs. Selected experiences in caring for and observing mothers and children in the home, hospital, and community.

330 Survey of Nursing II 3 Prereq junior in Nurs. The development of nursing before 1950.

440 Community Health Nursing 3 Prereq junior or senior in Nurs. Principles and concepts of Public Health Nursing as they affect the family in health and disease.

441 Community Health Nursing Practicum 3 (0-9) Prereq junior or senior in Nurs. Public Health Nursing experience in hospital, home, and community.

450 Survey of Nursing II 3 Prereq junior or senior in Nurs. Development of nursing after 1950; nursing research and literature; implications for the nurse practitioner.

460 Psychiatric Nursing 3 Psychiatric-mental health principles and concepts as related to comprehensive nursing care.

461 Psychiatric Nursing Practicum 3 (0-9) Prereq junior or senior in Nurs. Selected experiences in caring for and observing individuals with psychiatric problems.

480 Advanced Nursing 4 Prereq junior or senior in Nurs. Principles of leadership in developing, initiating, and assessing nursing care.

481 Advanced Nursing Practicum 8 (0-24) Guided experiences in providing comprehensive nursing care for groups of individuals.

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

**Schedule of Studies**

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses. Students who have not had two years of one foreign language in high school must take one year of one foreign language.

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>Engl 101 Composition</td>
<td>3</td>
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<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Chem 101 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Hum Elective</td>
<td>3</td>
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<tr>
<td>Nurs 101 or Elective</td>
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<td>P E</td>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 108 Intro to Literature</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 Introductory</td>
<td>4</td>
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<tr>
<td>Bio S 102 General</td>
<td>4</td>
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<tr>
<td>Hum or Soc S Elective</td>
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<td>P E</td>
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**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>H Ed 261 Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>Spec 112 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>6</td>
</tr>
<tr>
<td>Bect 101 or 201</td>
<td>4</td>
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<td>P E</td>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Zool 251 Human Physiol</td>
<td>4</td>
</tr>
<tr>
<td>Psych 201 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>FNIM 130 Nutrition for Man</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>6</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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**Summer Session**

| Nuns 300 Basic Nursing | 4 |
| Phar 360 Essential of Pharmacol | 3 |
Junior Year

First Semester
Nurs 310 Med-Surg Nursing 4
Nurs 311 Med-Surg Practicum 5
Nurs 330 Survey I 3
Elective 3-4
Hours

Second Semester
Nurs 320 Maternal-Child Nursing 4
Nurs 321 Maternal-Child Practicum 5
Psych Elective 3
Elective 3-4
Hours

Senior Year

First Semester
Nurs 440 Community Health Nurs 3
Nurs 441 Community Health Pract 3
Nurs 460 Psychiatric Nursing 3
Nurs 461 Psychiatric Practicum 3
Nurs 450 Survey II 3
Hours

Second Semester
Nurs 480 Adv Nurs 4
Nurs 481 Adv Nurs Practicum 5
Nurs 499 or Elective 3-4
Courses printed in Roman type are required for graduation, in italics are optional.

Transfer Students

Students who plan to transfer to nursing at Washington State University from other institutions should coordinate their program with the nursing adviser early to select courses that will be applicable to the bachelor's degree requirements.

Registered nurses who plan to obtain their bachelor's degree from Washington State University may obtain information from the department of nursing on curriculum requirements and evaluation of nursing courses previously taken in a hospital or community college nursing program.

Program in Nutrition


The graduate program in nutrition is interdepartmental with faculty from the Departments of Animal Sciences and Foods, Nutrition, and Institution Management. The program offers courses of study leading to the degrees of Master of Science in Nutrition and Doctor of Philosophy. Post-doctoral studies also are available. Most common animal species including man are available for experimental subjects.

Other departments and laboratories contribute to the student's training in nutrition. The Departments of Animal Sciences, Foods, Nutrition, and Institution Management, Chemistry, Veterinary Physiology, and Agronomy offer supporting courses for the nutrition major. The Nuclear Reactor facilities are widely used for activation analysis and tracer studies by students seeking advanced degrees in nutrition.

Students wishing to pursue studies leading to advanced degrees in nutrition are encouraged to become proficient in chemistry (general inorganic, organic, and biochemistry) and physiology. Students holding bachelor's degrees in Mathematics, Physics, Zoology, Agriculture, and related fields may be admitted to the program provided the necessary prerequisites are taken prior to or upon enrollment. Students having an undergraduate major or equivalent in nutrition (animal nutrition or foods and nutrition) qualify for the graduate program in nutrition. Foreign languages and minors are encouraged but are not required for nutrition majors.

Department of Office Administration

Professor and Chairman of the Department, R. E. Hoskinson; Professor, E. A. Perkins; Associate Professors, Frances Sadoff, Ruth Wanner; Assistant Professors, Barbara Christiansen, Shirley Lines.

The department offers a course in office administration and a course in business education meeting requirements for teaching on the secondary school and junior college levels. It also offers courses for personal use as well as vocational electives for students in other departments.

The department offers a course of study leading to the degree of Bachelor of Arts in Office Administration.

Placement in Typewriting and Shorthand

Students with one or two semesters of high school typewriting are required to enroll in Of Ad 102; those with three or four semesters are required to enroll in Of Ad 203. Stu-
 students with two or three semesters of high school shorthand enroll in Of Ad 206 and 209; those with four semesters enroll in Of Ad 208 and 210.

**Description of Courses**

Of Ad For explanation see Index under "Symbols."

101 Beginning Typewriting 2 (1-3) For beginning students only. Keyboard mastery; technique, speed, and accuracy development; elementary typewriting problems.

102 Intermediate Typewriting 2 (1-3) Prereq Of Ad 101. Keyboard and technique review; speed and accuracy development; business letters, tabulations, and manuscripts.

105 Beginning Shorthand 4 (3-3) For beginning students only. Theory of Gregg shorthand; reading and recording skills.

203 Advanced Typewriting 2 (1-3) Prereq Of Ad 102. Manuscript and letter styles; statistical tabulations; production proficiency.


208 Advanced Shorthand 4 (3-3) Prereq Of Ad 206; c/f in 210. Sustained dictation at higher speeds; production of mailable letters.

209 Beginning Transcription 1 (0-3) Prereq Of Ad 101, 105. Transcription techniques; fundamentals to be observed in mailable transcripts.

210 Advanced Transcription 1 (0-3) Prereq Of Ad 102, 206. Continuation of Of Ad 209; production of mailable transcripts.

215 Calculating Machines 2 (0-6) Prereq sophomore standing. Working knowledge of electric adding machines and key-driven and rotary calculators.

220 Secretarial Practices 3 (1-6) Prereq Of Ad 102; sophomore standing. Filing; transcribing and duplicating machines; electric typewriters; duties and problems of a secretary; supervised work experience.

223 Business Communication 3 II Prereq Engl 101; Of Ad 102. Written business communication media; functional study of grammar.

312 Legal and Medical Shorthand 4 (3-3) I 1970-71 a/y. Prereq Of Ad 208. Recording and transcribing technical dictation; legal forms and medical records.

420 (320) Executive Secretarial Procedures 3 (1-6) II Prereq Of Ad 208, 210, 220. Integrated office production problems; administrative procedures; supervisory practices.

421 (325) Methods of Teaching Typewriting I I Prereq 1 yr typewriting. Principles, methods, and materials.

422 (326) Methods of Teaching Stenography I I Prereq 1 yr shorthand. Principles, methods, and materials.


425 Improvement of Instruction in Secretarial Subjects 3 S 1971 a/y. Prereq Of Ad 421, 422. Methods and development of materials for teaching secretarial subjects.

445 (345) Administrative Management 3 I Prereq Econ 201 or 203. Theory and practice in office organization and management including efficient utilization of equipment, facilities, systems, and personnel.

446 (346) Records Management 3 II Prereq Of Ad 445. Planning, organizing, and controlling office records systems; forms analysis and control.

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

**Schedule of Studies**

At least 27 of the total hours required for the bachelor's degree in this program must be in upper-division courses. The following schedule is for students who have had no previous instruction in secretarial subjects.

**Freshman Year**

**First Semester**

- Engl 101 Composition: 3
- Geog 102 or 105: 3
- Of Ad 101 Beg Typewriting: 2
- Psych 101 Prin of Behavior: 3
- Hum Elective: 3
- P E: 1/2

**Second Semester**

- Engl 255 Grammar: 3
- Of Ad 102 Inter Typewriting: 2
- Hum or Soc S Elective: 6
- Science Elective: 4
- P E: 1/2

**Sophomore Year**

**First Semester**

- Of Ad 105 Beg Shorthand: 4
- Of Ad 203 Adv Typewriting: 2
- B A 201 Organization and Mgt: 3
College of Pharmacy

Of Ad 215 Calc Machines 2
Science Elective 4
P E 1/2

Second Semester Hours
Of Ad 206 Inter Shorthand 4
Of Ad 209 Beg Transcription 1
Econ 201 Principles 4
Of Ad 223 Business Comm 3
Science Elective 4
P E 1/2

Junior Year

First Semester Hours
B A 210 Law and Business 3
B A 230 Prin of Acctgg 4
Of Ad 208 Adv Shorthand 4
Of Ad 210 Adv Transcription 1
Of Ad 345 Administrative Mgr 3

Second Semester Hours
B A 231 Prin of Acctg 3
B A 311 Commercial Transactions 3
Of Ad 220 Secretarial Practices 3
Of Ad 346 Records Mgr 3
Elective 3

Senior Year

First Semester Hours
B A 350 Personnel 3
B A 360 Marketing 3
Elective 9

Second Semester Hours
Econ 320 or 340 3
Of Ad 320 Exec Sec Procedures 3
Elective 8

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

Business Education

Students desiring to prepare for business teaching should follow the business majors and minors listed under Department of Education.

College of Pharmacy

Professor and Dean of the College, A. I. White; Professors, V. N. Bhatia, M. R. Gibson, C. F. Martin, J. L. Way; Associate Professors, W. E. Johnson, A. R. Martin; Assistant Professors, R. K. Campbell, W. L. Chiou, D. R. Galpin; Instructor, G. Deliganis.

The pharmacy curriculum is divided into five areas: Pharmacy—dealing mainly with compounding; pharmaceutical chemistry—the principles of chemistry applied to the problems of pharmacy; pharmacognosy—the study of drugs of natural origin; pharmacology—the study of the action of drugs; and pharmacy administration—the study of the business principles and laws of pharmacy.

A student may enroll in professional elective courses during the fourth professional year to prepare himself for specialized careers in professional, retail, or hospital pharmacy; detailing physicians on pharmaceutical products; teaching; research and development in industry; or government. However, not less than 50 per cent of the elective credits in the fourth professional year must be earned in courses other than those offered by the College of Pharmacy. The intent of this policy is to further the liberal education of the pharmacy student.

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 Pharmaceutical Science, and Doctor of Philosophy (Pharmaceutical Science).

Description of Courses

For explanation see Index under "Symbols"

Pharmacy

Phar
101  Orientation 1 I Open to all students.

302  Basic Pharmaceutics II 3 (2-3) II Prereq Phar 301. Theory, preparation, and applications of solid pharmaceutical dosage forms.

401  Dispensing 5 (3-6) I Prereq Phar 415, 462. Development of professional competence in dispensing pharmaceuticals by application of scientific principles to compounding; study of prescription specialties.

402  Dispensing 5 (3-6) II Prereq Phar 401. Continuation of Phar 401.

404  Hospital Pharmacy Practice 2 II Prereq Phar 302. The responsibilities and services of hospital pharmacists in administration; formulation, production, and control of pharmaceuticals; professional consultations.

407  Industrial Pharmacy 3 (2-3) I Prereq Chem 217; Phar 415. Problems and methods.
History and Ethics of Pharmacy 2 II Prereq senior standing. The profession and professional ethics; the political, economic, and social factors affecting the status of the profession.

Basic Pharmaceutics III 3 (2-3) I Prereq Phar 302. Theory, preparation, and application of liquid and semisolids of pharmaceutical dispersions.

Biopharmaceutics 4 (2-6) II Prereq Phar 415. Dosage form evaluation as to stability, availability, absorption, distribution, and excretion of drugs; allied analytical procedures.

Medical Devices and Convalescent Aids 2 I Methods of manufacture, points of quality, and use and care of medical devices and sickroom supplies.

Biological Products from a Pharmaceutical Standpoint 2 II Prereq Bact 101; Chem 361; Phar 342. Methods used in the production, standardization of biologicals, indications for their use, and their limitations.

Advanced Pharmacy 3 Prereq Chem 332. Pharmaceutical disperse systems.

Pharmacokinetics 2 I 1970-71 a/y. Kinetic aspects of drug absorption, distribution, and excretion; biophysical-chemical factors influencing the time variation of drug concentrations.

Advanced Topics in Industrial Pharmacy 3 (1-6) I Prereq Chem 332. Theoretical considerations and laboratory projects.

Pharmaceutical Chemistry

Phar

Organic Pharmaceutical Chemistry 3 I Prereq Chem 249; Phar 302. Nomenclature, properties, structural relationships, uses and doses of synthetic organic medicinals, and some related purified natural products.

Inorganic Pharmaceutical Chemistry 3 II Continuation of Phar 423.

Pharmaceutical Analysis and Control 3 I Procedures and instruments used in analytical and control methods.

Pharmaceutical Analysis and Control 3 (1-6) II Continuation of Phar 525.

Alkaloids 2 I Origin, structure, and synthesis.

Chemical Structure and Drug Action 3 Prereq 10 hrs Org Chem; Pharmacology or Biochem. Theories of medicinal chemistry.

Chemical Structure and Drug Action 3 II Prereq Phar 531. Effect of variation of structure on pharmacological properties of selected classes of medicinals.

Steroids 2 I Prereq Chem 542. The sources, chemistry, and stereochemistry of medicinally important steroids.

Steroids 2 II Prereq Pharm 533. Continuation of Phar 533.

Pharmacognosy

Phar


Microscopy of Natural Products 3 (1-6) II Prereq Phar 342. Common products found under the jurisdiction of the Food and Drug Administration.

Natural Drug Products and Plant Principles 4 (2-6) II Prereq Chem 461. Location, occurrence, and isolation of plant constituents of the important drug classes.

Plants and Drugs 3 (2-3) II History, processing, source, microchemistry, and anatomy of plants which become drugs and sources of drugs.

Advanced Pharmacognosy 3 I Biosynthetic and chemotaxonomic relations in drug plants.

Pharmacology

Phar

Pharmacology 4 (3-3) I Prereq Chem 361; Zool 353. Pharmacodynamics, toxicology, and therapeutic uses of drugs.

Pharmacology 4 (3-3) II Prereq Phar 461. Continuation of Phar 461.

Pharmacochemistry 2 I Prereq Phar 462. Discussion and pharnacotherapy of the more important disease states.

Toxicology 2 II Prereq Phar 462 or c/9. The common household, industrial, agricultural, and economic poisons.
561 Advanced Pharmacology 4 (3-3) I Pre-req Pharm 462. Lectures, laboratory, and conferences on the more advanced concepts and applications of drug action.

562 Advanced Pharmacology 4 (3-3) II Prereq Pharm 561. Continuation of Pharm 561.

Pharmacy Administration

Phar 482 Pharmacy Law 3 II Prereq senior standing. State and federal laws pertaining to pharmacy and their relationship to professional problems.

485 Pharmacy Management 3 I Prereq B A 230; Econ 201. Problems and procedures in the establishment and management of a retail pharmacy.

Problems, Seminar, and Research and Thesis

Phar 200 Seminar I II Prereq Pharm 101.

413 Seminar 1 Prereq senior standing. Required of majors.

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

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 70 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Prepharmacy Year

First Semester

Bio S 103 Introductory 4
Chem 105 Principles 4
Math 107 Precalculus 3
ROTC or Elective 2
P E 1/2

Second Semester

Bio S 104 Introductory 4
Chem 106 Principles 4
Engl 101 Composition 3
Hum or Soc S Elective 3
ROTC or Elective 2
P E 1/2

First Professional Year

First Semester

Phar 101 Orientation 1
Chem 241 Organic 5

Engl 201 Inter Composition 3
Phys 101 General 4
Hum or Soc S Elective 3
ROTC or Elective 2
P E 1/2

Second Semester

Chem 217 Quant Analysis 4
Chem 242 Organic 3
Chem 243 Organic Lab 2
Phys 102 General 4
ROTC or Elective 2
P E 1/2

Second Professional Year

First Semester

Phar 301 Basic Phar I 4
Phar 341 Beg Pharmacognosy 5
Chem 364 Biochemistry 3
Chem 366 Biochemistry Lab 1
Zool 352 Zoophysiology 4

Second Semester

Phar 302 Basic Phar II 3
Phar 342 Pharmacognosy 3
Bact 101 Elementary 4
Hum, Soc S, or Approved Elective 3
Zool 353 Zoophysiology 4

Third Professional Year

First Semester

Phar 415 Basic Phar III 3
Phar 423 Organic Phar Chem 3
Phar 425 Inorganic Phar Chem 2
Phar 461 Pharmacology 4
Econ 201 Principles 4

Second Semester

Phar 416 Biopharmaceutics 4
Phar 424 Organic Phar Chem 3
Phar 462 Pharmacology 4
B A 230 Prin of Acctg 4

Fourth Professional Year

First Semester

Phar 401 Dispensing 5
Phar 413 Seminar** 1
Phar 482 Law 3
Elective** 6

Second Semester

Phar 402 Dispensing 5
Phar 414 History and Ethics 2
Phar 485 Management 3
Elective** 6

*May be taken either first or second semester.

**At least 6 hours of the elective credit must be earned in nonpharmacy courses.

Courses printed in Roman type are required for graduation, in italics are optional.
Preparation for Graduate Study

As preparation for work toward an advanced degree in pharmacy, the usual pattern is completion of the requirements for a bachelor's degree in pharmacy. In particular instances, students having undergraduate majors in chemistry or the biological sciences may be suitably prepared for graduate study in pharmacy.

It is desirable that students present courses in calculus and physical chemistry as preparation for graduate study. Students declaring an intent to pursue graduate study may have 1A 230 and Phar 485 waived from their undergraduate programs and use the elective courses in the fourth professional year for suitable advanced courses in chemistry, biology, and pharmacy.

Department of Philosophy

Associate Professor and Chairman of the Department, W. H. Hayes; Associate Professors, D. H. Bishop, J. E. Broyles, J. C. Carlyle; Assistant Professors, J. M. Bush, E. F. Crowell, J. W. Lithe, A. W. Wald.

The study of philosophy gives the student contact with the attempts of people through the ages to solve their most urgent problems. Analyzes the methods of science, allows the student to gain a critical attitude toward his own thinking, and a more mature approach to values.

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

Description of Courses

For explanation see Index under "Symbols"

00 [H] Great Philosophers of the Western World 1 The questions of man, the world, God, freedom, morals, and politics.
01 [H] Introduction to Philosophy 3 For freshmen only. Nature and place of philosophy in human thought; problems and achievements.
02 [H] Introduction to Philosophy 3 For sophomores, juniors, and seniors only. Same as Phil 101.
07 [H] Philosophy of Religion 3 Western religious thought; nature and knowledge of God, relations to science, morality, and society.
201 [H] Elementary Logic 3 Principles of deductive and inductive reasoning; valid argument; scientific method.
207 [H] Philosophies of India 3 I 1971-72 a/y. Prereq Phil 101 or 107. The metaphysics, epistemology, ethics, aesthetics, and social philosophy of Hinduism, Buddhism, Islam, and other schools of thought.
220 [H] Aesthetics 3 I Philosophy of art; analysis of aesthetic experience; criteria of art criticism.
301 Symbolic Logic 3 II 1970-71 a/y. Prereq Phil 201.
315 Philosophies of China and Japan 3 I 1970-71 a/y. Prereq Phil 101, 107, or 207. Confucianism, Taoism, Shintoism, and Mahayana Buddhism dealt with historically and in terms of central beliefs.
330 [H] Ethics 3 II 1971-72 a/y. Prereq Phil 101. Problems and principles of ethics; classical and contemporary philosophers.
345 Philosophical Concepts of Black Revolution 3 II The meanings and implications of such concepts as blackness, separation, integration, alienation, and discrimination.
410 Philosophy of Language 3 II 1971-72 a/y. Prereq 6 hrs Phil. The nature of conceptual knowledge by examining the manner in which this knowledge is expressed in language.
420 Existentialism 3 II Prereq Phil 101. The movements of religious and non-religious existentialism beginning with Kierkegaard, and including Sartre, Beauvoir, Jaspers, Brunner, Niebuhr, and Tillich.

425 Philosophy of the Behavioral Sciences 3 I 1970-71 a/y. Prereq Phil 201 or 415. Majors in Phil, Ph S, Bio S, or Soc S.

430 Philosophy of Literature 3 II Prereq 3 hrs Phil. Nature of the literary work of art; principles of literary criticism and evaluation.

435 American Philosophy 3 II 1971-72 a/y. Prereq Phil 101 or 107. Classical American philosophers; the pragmatists, Peirce, James, and Dewey.


480 Philosophy of the Natural Sciences 3 II 1970-71 a/y. Prereq Phil 201; 6 additional hrs Phil.

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

510 Seminar in the History of Philosophy 3 May be repeated for credit. I Prereq 12 hrs Phil.

515 Philosophy of Mathematics 3 I 1970-71 a/y. Prereq Phil 301, 315, or 9 hrs Phil. Rival interpretations concerning concepts, structure, and nature of mathematics.

520 Seminar in Contemporary Ideas 3 May be repeated for credit. II Prereq 12 hrs Phil.

530 Advanced Ethics 3 I 1970-71 a/y. Prereq Phil 330 or 9 hrs Phil. Discussion and reading in recent ethical theory.

540 Philosophy of Mind 3 I 1970-71 a/y. Prereq Phil 101, 220 or 330 or 310; or 9 hrs Phil. Theories of mind, self, mental acts, psychological states, and human action.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

It is recommended that departmental majors complete the following requirements by the end of the sophomore year: Phil 101, 201, and three fourths of the graduation requirements of the College of Sciences and Arts. All departmental majors are required to take Phil 300, 305, 310, 330, 335 or 440, 415 or 435. Supplementary courses in the College of Sciences and Arts will be arranged in consultation with the members of the Department of Philosophy.

Preparation for Graduate Study

Students who have completed basic undergraduate work in philosophy while majoring in other areas, either in the sciences or humanities, may be suitably prepared for graduate study in philosophy.

Students from other institutions may judge the adequacy of their preparation by comparison with the departmental requirements for undergraduate majors. Those who have not completed standard courses in the History of Philosophy, Ethics, Epistemology, or Logic should regard these as deficiencies which must be made up in the early stages of their graduate program.

Departments of Physical Education for Men and Women

Department of Physical Education for Women

Professor and Chairman of the Department, Carol E. Gordon; Associate Professors, Dorothy Coleman, Mary Lou Enberg, Jane Ericson, Alice Gates, Agnes McQuarrie, Madge Phillips; Assistant Professors, Marlene Adrian, Sue Durans, Joanne Sprenger; Instructors, Diane Albright, Marilyn Mowatt, Joanne Washburn, Wilhelmina Weaver.

Department of Physical Education for Men

The Departments of Physical Education for Men and Women unite the interests of the following areas: professional physical education for the teacher and coach, the required service programs for all students, prephysical therapy, professional recreation, intramural programs, intercollegiate activities, and health education.

Physical Education Activity Courses
All undergraduate students are required to complete four semesters of activity courses chosen from the listings under CPE, MPE, or WPE.

For Women: During one of the first two semesters a freshman will take WPE 102. Entering students who cannot swim are encouraged to take, as a part of the physical education requirement, a semester of beginning swimming.

For Men: During one of the first two semesters a freshman will take MPE 101. If a student earns credit for a varsity sport, this credit fulfills the physical education credit requirement for the semester. A student may use the same intercollegiate sport only once during the year to satisfy his physical education requirement. Varsity sports may not be elected for credit after the physical education requirement is met.

Physical Education
The physical education curriculum is designed to provide a solid professional preparation for future teachers of physical education. Students majoring in elementary education may also take physical education as their area of subject-matter concentration.

Men majoring in physical education should select a minor in an unrelated field. Women majors are urged to select a health education minor or one in an unrelated field. Students working toward a degree in physical education may elect to concentrate in dance by enrolling in the following courses: WPE 151, 154, 155; CPE 158; PEP 254, 255, 256, 257, 281; Rec 151, 251, 357.

Health Education
Dorothea Coleman, Adviser
The program of studies for the health education minor is designed to prepare education majors who are likely to teach health education on the junior or senior high school level.

A minor in health education is strongly recommended for physical education majors.

The requirements for the health education minor are met by the following courses: H Ed 161, 261, 263, 383, 480; FNIM 130; Zool 251, and one elective from Soc 160, 370, 351, 330; Psych 201 or 360. Physical education majors must substitute Bact 101 or another science for Zool 251.

Recreation
Agnes M. McQuarrie, Adviser
The undergraduate recreation curriculum provides a broad general and cultural education in the humanities, the social and natural sciences, and the arts, and a specialized background in the professional areas of history and philosophy, leadership techniques, program planning, community organization, and field work experiences.

The major in recreation must, in addition to the general university and the required departmental courses, complete courses in at least six of the program competency areas: arts and crafts, aquatics, dance, drama, gymnastics, hospital recreation, individual and dual sports, outdoor recreation, social recreation, and team sports. In addition, the major will select an option of his choice, either Program Supervision or Park Administration.

1. Program Supervision. Designed to provide maximum flexibility for students desiring a broad foundation in recreation program methods and skills and program planning and supervision.
   A student must complete Rec 225, 357, 388, 488; and at least 12 hours in related program areas to be selected in consultation with his adviser.

2. Park Administration. Designed to provide a general foundation in the operational problems of parks and an understanding of the place of recreation and parks in public administration.
   A student must complete Hort 263, 363, M E 101; PEP 333; and at least 10 hours in related areas to be selected in consultation with his adviser.

A major in recreation may qualify for a teaching certificate with the completion of the subject matter requirements for physical education plus the requirements of the Department of Education. Students working toward a degree in recreation may elect to concentrate in dance by enrolling in the following courses: WPE 154, 155; PEP 254, 255, 256, 257, 356; Rec 151, 357.
Prephysical Therapy
Roger Larson, Adviser

The program of studies is designed to prepare the student for admission to the physical therapy professional curriculum program approved by the Council on Medical Education and Hospitals of the American Medical Association. Students majoring in prephysical therapy may elect to enroll in additional courses in the physical and biological sciences or may prepare for teacher certification in physical education.

Degrees

The departments offer courses of study leading to the degrees of Bachelor of Science in Physical Education, Bachelor of Arts in Recreation, Master of Science in Physical Education, Master of Arts in Recreation, Master of Arts in the Teaching of Physical Education, and Doctor of Philosophy (Physical Education).

Description of Courses

For explanation see Index under “Symbols”

Activity Courses

PE
05-129 Recreation and Dual Sports 1/2 (0-2) Bowling, fencing, golf, tumbling.
30-139 Aquatic Activities 1/2 (0-2) Diving, scuba diving, skin diving, swimming.
140-149 Individual Sports 1/2 (0-2) Badminton.
150-159 Dance Activities 1/2 (0-2) Social, modern.
68-175 Outdoor Recreation 1/2 (0-2) Equitation, fishing, hunting, skiing.

WPE
101 Freshman Physical Activity 1/2 (0-2) Testing, classifying, developmental, selected team sports.
105-129 Recreation and Dual Sports 1/2 (0-2) Apparatus, bag punching, bowling, boxing, golf, gymnastics, track, trampoline, tumbling, wrestling.
130-139 Aquatic Activities 1/2 (0-2) Diving, scuba diving, swimming.
140-149 Individual, Dual, Team Sports 1/2 (0-2) Archery, badminton, handball, soccer, tennis, volleyball.
150-159 Dance Activities 1/2 (0-2) Social, modern.

160-164 Weight Training 1/2 (0-2)
165 Adapted Physical Education 1/2 (0-2)
176-190 Varsity Sports 1/2 (0-2)

WPE
102 Freshman Activities 1/2 (0-2)
103 Fundamentals of Movement 1/2 (0-2) Basic skills used in everyday living and sports.
105-129 Recreation and Dual Sports 1/2 (0-2) Apparatus, bowling, fencing, field hockey, golf, gymnastics, track, trampoline, tumbling, volleyball.
130-139 Aquatic Activities 1/2 (0-2)
140-149 Individual and Team Sports 1/2 (0-2) Archery, badminton, tennis.
150-159 Dance Activities 1/2 (0-2) Social, modern.

Professional Courses

PEP
191 Soccer and Volleyball (W) 2 (0-6) Techniques, individual and team tactics, and officiating.
192 Basketball and Softball (W) 2 (0-6) Techniques, individual and team tactics, and officiating.
193 Lifesaving and Aquatics 2 (0-6) Prereq: swimming or equivalent. Red Cross lifesaving and water safety certificates awarded to those who qualify.
195 Tumbling and Trampoline (M) 1 (0-3) Same as PEP 196.
196 Tumbling and Trampoline (W) 1 (0-3) Skills and techniques in trampoline, tumbling, hand balancing, and pyramid building.
197 Gymnastics Apparatus (M) 1 (0-3) Skills and techniques; horizontal bar, balance beam, rings, side horse, vaulting, even and uneven parallel bars.
198 Gymnastics Apparatus (W) 1 (0-3) Same as PEP 197.
199 The Professions of Physical Education and Recreation 2 For freshmen and sophomores only. Related areas of prephysical therapy and coaching.
220 Officiating (Athletics) (M) 2 (1-3)
223 Fundamentals of Baseball 1 (0-3) Development of the fundamental baseball skills.
224 Fundamentals of Basketball 1 (0-3) Development of the fundamental basketball skills.
225 Fundamentals of Football 1 (0-3) Fundamental skills in all areas of football.
Physical Education Techniques (W) 1 (0-3) Techniques in contests, recreational, and selected sports.

Physical Education Techniques in Individual and Dual Sports (W) 2 (1-3)

Creative Rhythms for Children 2 (1-3) For elementary school teachers and recreation leaders.

Advanced Modern Dance 1 (0-3) May be repeated for 3 hours credit. Prereq 2 sem modern dance. Solo and group composition; dances for performance.

Theory of Dance 2 Prereq CPE 154 or 155; Rec 151. Historical background; philosophy.

Coaching of Baseball 1 Prereq PEP 225 or a reasonable level of skill. Preparation for baseball coaching at the junior or senior high school level.

Coaching of Basketball 1 Prereq PEP 224 or a reasonable level of skill. Preparation for coaching basketball at the junior or senior high school level.

Coaching of Football 1 Prereq PEP 225 or a reasonable level of skill. Preparation for football coaching at the junior or senior high school level.

Coaching of Gymnastics 1 Prereq reasonable level of skill. Preparation for coaching gymnastics at the junior or senior high school level.

(226) Coaching of Track and Field 1 Prereq reasonable level of skill. Preparation for coaching track and field at the junior or senior high school level.

Coaching of Wrestling 1 Prereq reasonable level of skill. Preparation for coaching wrestling at the junior or senior high school level.

(231) Methods and Materials for Teaching Skill Activities 2 (1-3) Prereq competency in individual, dual, and team sports. Methods and techniques for teaching various sport activities common to physical education programs.

Aquatics Programs 2 Prereq PEP 193. Aquatics; organization and administration.

(255) Creative Dance for the Teacher 2 (1-3) II Prereq 2 sem modern dance.

Advanced Modern Dance Composition and Choreography 1 (0-3) May be repeated for 3 hours credit. Prereq PEP 256. Solo and group dances in modern dance idiom for performance and production.

(262) Kinesiology and Adapted Physical Education 3 (2-3) Prereq H Ed 261. Care and Prevention of Athletic Injuries 2 (1-3) Prereq H Ed 261 or Zool 251.

(280) Physical Education for the Elementary School 2 (1-3) For Elem Educ majors. Materials and methods of instruction.

(281) Physical Education for the Elementary School 2 (1-3) For P E majors or minors only. Materials and methods of instruction.

The Physical Education Program 6 (4-6) Prereq PEP 381. Principles, methods, and directed teaching.

The Atypical Student in P E 2 or 3 (2-3) II Prereq PEP 362. Individual differences as they relate to the physical education student.

Physiology of Exercise 3 (2-3) Prereq H Ed 261; Zool 251.

Elementary School Physical Education 2 or 3 Prereq PEP 381; Psych 101 or teaching experience.

Physical Education Curriculum 2 or 3 Prereq PEP 382; Educ 201 or teaching experience. Principles of constructing and evaluating the physical education curriculum of public schools.

Administration of Physical Education 2 Prereq PEP 382.

Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Prereq PEP 382.

Administration of Athletics 1 Prereq PEP 382.

Principles and Problems of Coaching 2 Prereq P E major or minor or coaching minor. Problems inherent in coaching interscholastic sports; solution of problems through application of principles.

Tests and Measurements in Physical and Health Education and Recreation 3 (2-3) Prereq PEP 382.

Physical Fitness in the School Program 2 or 3 Prereq PEP 382. Responsibilities of school specialists for cooperation in development of fitness programs; research findings and methods of evaluation.

Senior Seminar 1 II Prereq senior standing.

Special Problems 1-4 May be repeated for credit.

Mechanical Analysis of Motor Activity 3 Prereq PEP 362 or Phys 101. Fundamental laws of mechanics applied to motor activities.
Advanced Physiology of Exercise 2  
Prereq PEP 465. Metabolic adjustment made in response to exercise and training with major emphasis upon research findings.

Biomechanics 3 (2-3) Prereq PEP 465;  

History and Philosophy of Physical Education and Recreation 2 or 3 Prereq PEP 382. Historical and contemporary philosophies, with implications and interpretations for objectives, methodology, and course content.

Physical Education Programs for Junior and Senior Colleges 3 Prereq PEP 486. Professional, required, intramurals, adaptive, research, and recreational-type programs for general education and professional physical education students.

Modern Trends in Physical Education, Recreation, and Athletics 2 or 3

Administration and Supervision of Physical Education 2 or 3 Prereq PEP 486.

Research Lab Techniques 2 (1-3) or 3 (2-3) Prereq PEP 465. Application and use of laboratory research equipment in physical education.

Motor Learning 3 Prereq Psych 101;  
Zool 251. Exploration of learning theory, learning models, and experimental evidence related to learning of perceptual-motor skills.

Methods of Research and Experimental Design 2 or 3

Advanced Tests and Measurements 2 (1-3) or 3 (2-3) Prereq PEP 494. Types of tests and measurements used in physical education applied to public schools and individual testing.

Seminar 2 May be repeated for credit.

Special Problems 1-4 May be repeated for credit.

Research, Thesis, or Examination Variable credit.

First Aid 2 Advanced and instructional teaching in first aid; accident prevention. Certificates awarded.

School Health Instruction 2 Prereq  
H Ed 161. Methodology, materials, and resources.

Advanced Human Anatomy 2 (1-3)  
Prereq H Ed 261. Regional dissection and study of gross anatomical body parts.

School Health Programs 2 I  
Philosophy, principles, and practices.

Special Problems 1-4 May be repeated for credit.

Rec

Introduction to Recreational Dance 2  
(1-3) Techniques of folk, square, and social dancing.

Camping Education 3 (2-3) II Techniques in outdoor living.

Handicrafts 2 (1-3) For Rec majors or minors only. Arts and crafts, materials, and activities suitable for campus, playgrounds, and recreational centers.

Recreational Dance for the Teacher 2  
(1-3) Prereq Rec 151. Methods and materials for social, folk, and square dancing.

Physical Education and Recreation Productions I Techniques of program planning and direction.

Recreation Programs 3 I Prereq PEP 381; junior standing. Principles, methods, and materials for recreation programs in a variety of settings.

Leadership in Social Recreation 2 (0-6)  
I 1970-71 a/y. Prereq PEP 381; Psych 101; Soc 101.

Recreation for the Handicapped 3 S  
Prereq upper-division or graduate students.

Organization and Administration of Recreation 3 Prereq Rec 388.

Therapeutic Recreation 2 II Prereq Rec 388.

Leadership Through Youth Agencies 2  
II Prereq Psych 101. Structure and function of youth agencies and the role of recreation in the agency program.

Field Work in Recreation 8 (2-18) II  
Prereq junior or senior standing, C average in departmental requirements, cumulative C average. Supervised practice in an established recreation department.

Special Problems 1-4 May be repeated for credit.
591 Community Recreation Trends 3 II 1970-71 a/y. Prereq Rec 481 or PEP 486.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 31 of the total hours required for the bachelor’s degree in these programs must be in upper-division courses.

Physical Education, Recreation, and Prephysical Therapy

Physical Education for Women

During the freshman and sophomore years, a student is advised to complete the following courses and at least three-fourths of the General University Requirements. Those preparing to teach should consult the catalog listing of the Department of Education for certification requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PEP 191, 192, 193, 196, 198, 199</td>
<td>10</td>
</tr>
<tr>
<td>PEP 230, 232</td>
<td>3</td>
</tr>
<tr>
<td>H Ed 261 Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>WPE 103, 132, 154</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Rec 151, 251</td>
<td>4</td>
</tr>
<tr>
<td>Zool 251 Human Physiol</td>
<td>4</td>
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</table>

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEP 382 P E Program</td>
<td>6</td>
</tr>
<tr>
<td>PEP 362 Kinesiology</td>
<td>3</td>
</tr>
<tr>
<td>WPE 155</td>
<td>1 1/2</td>
</tr>
<tr>
<td>PEP 380-381 Elem P E</td>
<td>2</td>
</tr>
<tr>
<td>PEP 355 Creative Dance</td>
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Senior Year

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PEP 465 Phys of Exercise</td>
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<tr>
<td>H Ed 480 Sch Health Prog</td>
<td>2</td>
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<td>PEP 486 Admin of P E</td>
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</tr>
<tr>
<td>PEP 494 Tests and Measurements</td>
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</tr>
<tr>
<td>Elective</td>
<td>4</td>
</tr>
</tbody>
</table>

Physical Education for Men

Students who wish to obtain the bachelor’s degree are required to earn 40 hours of credit beyond the four-semester physical education requirement. The major portion of the General University Requirements should be completed during the first two years. If students choose to take the coaching minor certification option, they must obtain an additional minor in another field outside of physical education. The students will obtain their course work and competency in the following three areas:

A. Competency and course work in: MPE 126 or PEP 195, MPE 127 or PEP 197, CPE 132 or PEP 193; required courses and competencies. MPE 101, 102, 105, 107, 115, 117, 146, 160, 5 of these 8 courses or competencies.

B. Core of the required professional courses as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Ed 261 Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>263 First Aid</td>
<td>2</td>
</tr>
<tr>
<td>PEP 381 Elementary Physical Ed</td>
<td>2</td>
</tr>
<tr>
<td>331 Methods and Materials</td>
<td>2</td>
</tr>
<tr>
<td>362 Kinesiology</td>
<td>3</td>
</tr>
<tr>
<td>382 Physical Education Programs</td>
<td>6</td>
</tr>
<tr>
<td>465 Physiology of Exercise</td>
<td>3</td>
</tr>
<tr>
<td>486 Admin of Physical Education</td>
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<td>494 Tests and Measurements</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>26</td>
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</table>

C. Electives—12 hrs from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEP 193 Lifesaving</td>
<td>2</td>
</tr>
<tr>
<td>195 Tumbling and Tramp</td>
<td>1</td>
</tr>
<tr>
<td>197 Gymnastics</td>
<td>1</td>
</tr>
<tr>
<td>199 P E and Rec Professions</td>
<td>2</td>
</tr>
<tr>
<td>220 Officiating</td>
<td>2</td>
</tr>
<tr>
<td>324-328, 333</td>
<td>3</td>
</tr>
<tr>
<td>366 Care and Prevention</td>
<td>2</td>
</tr>
<tr>
<td>488 Admin of Athletics</td>
<td>1</td>
</tr>
<tr>
<td>489 Problems of Coaching</td>
<td>2</td>
</tr>
<tr>
<td>H Ed 161 Fundamentals of Health</td>
<td>2</td>
</tr>
<tr>
<td>Rec 151 Rec Dance</td>
<td>2</td>
</tr>
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<td></td>
<td>20</td>
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</tbody>
</table>

Recreation

During the freshman year, a student should have completed 15 hours toward general university graduation requirements including Psych 101, Soc 101, and Spe 112. The student should have completed PEP 199, F A 105, and at least two program competency areas.*

Option I. Program Supervision

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Rec 225 Handicrafts</td>
<td>2</td>
</tr>
<tr>
<td>Psych 201 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
<td>3</td>
</tr>
<tr>
<td>Option Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

227
Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>PEP 381 PE Elem School</td>
<td>2</td>
</tr>
<tr>
<td>Area Elective</td>
<td>2</td>
</tr>
<tr>
<td>Option Elective</td>
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</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
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<td>ROTC or Elective</td>
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<tr>
<td>P E</td>
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Junior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 206 State Local Govt</td>
<td>3</td>
</tr>
<tr>
<td>Psych or Soc Elective</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
<td>2</td>
</tr>
<tr>
<td>Option Elective</td>
<td>4</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Hum or Soc S Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Hort 363 Park Design</td>
<td>3</td>
</tr>
<tr>
<td>Rec 382 Rec Programs</td>
<td>3</td>
</tr>
<tr>
<td>PEP 335 Aquatic Programs</td>
<td>2</td>
</tr>
<tr>
<td>Area Elective</td>
<td>1</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rec 481 Org and Admin</td>
<td>3</td>
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<tr>
<td>Psych or Soc Elective</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
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<tr>
<td>Electives</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Rec 489 Field Work</td>
<td>8</td>
</tr>
<tr>
<td>H Ed 262 First Aid</td>
<td>2</td>
</tr>
<tr>
<td>Elective</td>
<td>5</td>
</tr>
</tbody>
</table>

* A minimum of one course from at least six of the following areas: (1) Arts and Crafts—Rec 225; (2) Aquatics—CPE 132, WPE 132, PEP 193; (3) Dance—Rec 151; (4) Drama—Spe 206; (5) Gymnastics—PEP 195, 197 (M); 196, 198 (W); (6) Therapeutic Recreation—Rec 482; (7) Individual and Dual Sports—PEP 231 (M); 230, 232 (W); (8) Outdoor Recreation—Rec 221, 435, 464; (9) Social Recreation—Rec 388; (10) Team Sports—PEP 191, 192 (W), 223, 224, 225, (M). Four additional hours to be selected from the above areas.

Option II. Park Administration

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>PEP 193 Lifesaving</td>
<td>2</td>
</tr>
<tr>
<td>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>Psych 201 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
<td>1</td>
</tr>
<tr>
<td>Option Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>PEP 381 PE Elem School</td>
<td>2</td>
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<tr>
<td>Hort 263 Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
<td>2</td>
</tr>
<tr>
<td>Option Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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</table>

Junior Year

First Semester

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<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GUR Science Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 206 State Local Govt</td>
<td>3</td>
</tr>
<tr>
<td>Psych or Soc Elective</td>
<td>3</td>
</tr>
<tr>
<td>Area Elective</td>
<td>2</td>
</tr>
<tr>
<td>Option Elective</td>
<td>4</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUR Hum or Soc S Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Hort 363 Park Design</td>
<td>3</td>
</tr>
<tr>
<td>Rec 382 Rec Programs</td>
<td>3</td>
</tr>
<tr>
<td>PEP 335 Aquatic Programs</td>
<td>2</td>
</tr>
<tr>
<td>Area Elective</td>
<td>1</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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</table>

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Rec 481 Org and Admin</td>
<td>3</td>
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<tr>
<td>Psych or Soc Elective</td>
<td>3</td>
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<tr>
<td>Area Elective</td>
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<tr>
<td>Electives</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rec 489 Field Work</td>
<td>8</td>
</tr>
<tr>
<td>H Ed 262 First Aid</td>
<td>2</td>
</tr>
<tr>
<td>Elective</td>
<td>5</td>
</tr>
</tbody>
</table>

Prephysical Therapy

Students who wish to obtain a bachelor's degree to qualify for admission into the fifth-year certificate programs for physical therapist are required to earn 36 credits within the department and 45 credits in related areas, some of which can be taken to meet General University Requirements.

A. Core Curriculum—Departmental Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEP 197 (M) or PEP 198 (W) Gymnastics Apparatus</td>
<td>1</td>
</tr>
<tr>
<td>PEP 193 Life Saving and Aquatics</td>
<td>2</td>
</tr>
<tr>
<td>PEP 199 Profession of Physical Education</td>
<td>2</td>
</tr>
<tr>
<td>PEP 362 Kinesiology</td>
<td>3</td>
</tr>
<tr>
<td>PEP 381 Elementary School Activity</td>
<td>2</td>
</tr>
</tbody>
</table>
PEP 382 Physical Education and Recreation Program 6
PEP 463 Atypical Student 2
PEP 465 Physiology of Exercise 3
PEP 494 Tests and Measurements 3
Rec 151 Recreational Dance 3
Rec 435 Outdoor Education 6
Rec 464 Recreation for the Handicapped 3

B. Supporting courses outside of department including:
Spe 112 Fund of Speech 3
Soc 101 Introduction 3
Psych 101 Prin of Behavior 3
Psych 201 Prin of Behavior 3
Psych 362 Deviant Behavior 3
Phys 101 General Physics 4
Phys 102 General Physics 4
Chem 101 Intro Chemistry 4
Chem 102 Intro Chemistry 4
Math Elective 3
Bact Elective 3
H Ed 261 Anatomy 3
H Ed 262 First Aid 2
Zool 251 Intro Hum Physiol 4
PEP 366 Care and Prevention 2
Psych 464 Exceptional Children 3

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 chairman of the department.

Preparation for Graduate Study
As preparation for work toward an advanced degree in physical education, a student should have completed not less than 30 hours in physical education including H Ed 261; PEP 362, 382, 465, 486, 494; Zool 251.
As preparation for work toward an advanced degree in recreation, a student should have completed the equivalent of the above schedule of studies, except Rec 464 which may be used on an advanced degree program.

Physical Science Courses
Ph S For explanation see Index under "Symbols"

101 [P] An Integrated Course in Physical Science 3 Open to freshmen and sophomores only. Physical phenomena and theories illustrating the nature of science, applications to material needs, and influences on society.


330 Methods of Teaching Physical Science 2 Prereq 12 hrs science; Educ 405 or 406. Principles and materials for teaching general science, physics, and chemistry.

347 Radiation Control 2 Historical developments; radiological units and calculations; pertinent local, state, and federal regulations.

390 [P] Science, Technology, and Civilization 3 Open to junior and senior non-science majors only. Not open to students who have taken Ph S 101. Scientific principles and technological advances responsible for major contemporary developments and associated social and cultural responses.

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

Department of Physics

Graduate students are offered the opportunity of pursuing original investigations in geophysics, theoretical physics, nuclear physics, the physics and chemistry of surfaces, shock wave propagation, and solid state physics.

The department offers courses of study leading to the degrees of Bachelor of Science in Physics, Master of Science in Physics, Master of Arts in the Teaching of Physics, and Doctor of Philosophy.
Description of Courses

Phys For explanation see Index under "Symbols"

101 [P] General Physics 4 (3-3) I Fundamental principles and applications of mechanics, heat, and sound; oriented toward non-Ph S majors.

102 [P] General Physics 4 (3-3) II Prereq Phys 101. Fundamental principles and applications of optics, electricity, magnetism, and atomic and nuclear physics; oriented toward non-Ph S majors.

171 (103) [P] Physics and Natural Philosophy 4 (3-3) I Classical physics; particles and waves, mechanics, electromagnetics, thermodynamics; intellectual and cultural values, not technical applications.

172 (104) [P] Physics and Natural Philosophy 3 II Prereq Phys 101 or 171. 20th century physics: relativity and quantum physics, philosophy of physics; intellectual and cultural values, not technical applications.


281 (203) [P] Classical Physics for Scientists and Engineers Honors 4 (3-3) Same as Phys 201.


303 Modern Physics 3 Prereq Phys 202. Introduction to atomic, nuclear and solid state physics, and relativity.

310 Modern Laboratory Techniques 3 (1-6) I Prereq Phys 102 or 202. Fundamental laboratory techniques and data analysis, research techniques of current interest, and classical experiments.

320 (321) Mechanics 3 I Prereq Math 273 or c/. Phys 102 or 202. Particle motion in one, two, and three dimensions; motions of systems of particles; rigid body motion; Lagrange's equations.

330 (322) Thermal Physics 3 II Prereq Math 273 or c/. Temperature, zeroth, first, second, and third laws of thermodynamics; changes of phase, simple systems, low-temperature phenomena, and equipartition theorem.


342 (354) Electricity and Magnetism 3 II Continuation of Phys 341. Applications of Maxwell's equations to propagation of electromagnetic fields; special theory of relativity and relativistic electromagnetism.

350 (405) Quantum Mechanics 3 II Prereq Phys 303, 320. Introduction to quantum theory.

410 Electronics 3 (1-6) I Prereq Phys 102 or 202. Fundamental electronics with laboratory construction and investigation of electronic circuits employed in typical research instruments.

412 Nuclear Instrumentation 2 (1-3) I Prereq Chem 305 or Phys 410. Operational principles of electronic instruments used in nuclear science and engineering.

434 Introduction to Molecular Biophysics 3 II Same as Bio Phys 412.

433 (324) Optics 2 I Prereq Phys 341. Diffraction, interference, and polarization phenomena of the electromagnetic spectrum; crystal optics.


463 (408) Physics of the Solid State 3 II Prereq Phys 350. Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence.


471 (401) Introduction to Theoretical Physics 3 I Prereq Math 273 or c/. Language of mathematical physics; continuous and molecular theory of matter.

472 (402) Introduction to Theoretical Physics 3 II Prereq Phys 341, 471. Theory of fields; relativity and quantum theory.

490 (440) Seminar 1

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

521 (503) Advanced Mechanics 3 II Prereq Phys 320, 471. Laws of motion as developed by Newton, d'Alembert, La-
532 Thermodynamics 3 II Same as Chem 532.
539 Group Representation Theory and Its Applications 3 I Same as Math 539.
541 (518) Advanced Electromagnetic Theory 3 I Maxwell's equations; emission, propagation, and absorption of electromagnetic waves.
542 (519) Advanced Electrodynamics 3 II Continuation of Phys 541. Antenna and multipole radiations, relativistic electrodynamics, classical electron theory, applications to modern physics, supplementary topics.
551 (501) Quantum Theory I 3 I Prereq Phys 471. Schrodinger-Heisenberg theory of particles; operator and matrix methods; perturbation theory.
552 (502) Quantum Theory II 3 II Prereq Phys 551. Electron spin; relativistic quantum theory; quantum field theory.
561 (511) Atomic Spectra and Structure 3 I Prereq Phys 551. Experiments and theoretical interpretation of spectral series; fine structure; hyperfine structure; Zeeman, Stark, and Pauli effects. Cooperative course taught at the University of Idaho.
562 (512) Molecular Spectra 3 II Prereq Phys 561. Molecular spectra and structure with emphasis on diatomic and triatomic molecules. Cooperative course taught at the University of Idaho.
563 Advanced Solid State Physics 3 I Prereq Phys 463, 551 and 521. Quantum theory of lattice vibrations; nearly free electron theory of solids, tight binding approximation, density of states effects; motion of Bloch electrons in electric and magnetic fields.
565 (514) Nuclear Physics 3 Prereq Phys 465, 551. Advanced treatment of nuclear phenomena including radioactivity, static properties of nuclei, nuclear forces and models, and elementary particles.
581 (541) Advanced Topics 2 May be repeated for credit. I Topics of current research interest in shock waves, solid state, high vacuum, nuclear physics, and mathematical physics.
590 (540) Seminar 1
592 (542) Seminar in Wave Propagation 2 May be repeated for credit. Prereq Phys 471 or 571. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves.
593 (543) Surface Physics 1 May be repeated for credit. Interactions of gases and vapors with solid surfaces: adsorption, desorption, and reactions.
595 Nuclear Physics Seminar 1 or 2 Advanced nuclear and fundamental particle topics.
599 Special Problems 1-4 May be repeated for credit.
600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

The minimum requirement for the bachelor's degree in physics is that the student complete 14 hours in physics beyond the courses in Elementary Classical Physics (201 and 202 or equivalent) and Modern Physics (303), 9 hours of approved upper-division courses (not necessarily in Physics), and mathematics through Multivariable Calculus (Math 273). At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester
Math 171 Calculus I 4
Chem 105 or 111 4-5
English 101 or Elective 3
ROTC or Elective 2
P E 1/2

Second Semester
Phys 201 Classical Phys 4
Chem 106 or 212 4-5
Math 172 Calculus II 4
English 101 or Elective 3
ROTC or Elective 2
P E 1/2
Sophomore Year

First Semester
- Phys 202 Classical Phys 4
- Math 220 Linear Algebra 3
- Approved Elective 1 6
- ROTC or Elective 2
- P E 1/2

Second Semester
- Phys 330 Thermal Phys 3
- Phys 303 Modern Phys 3
- Math 273 Calc and Diff Eq 4
- Elective 4
- ROTC or Elective 2
- P E 1/2

Junior Year

First Semester
- Phys 310 Mod Lab Tech 3
- Phys 320 Mechanics 3
- Phys 341 Electricity and Mag 3
- Approved Electives 2 6

Second Semester
- Phys 322 Lab Techniques 1
- Phys 342 Electricity and Mag 3
- Phys 350 Quantum Mechanics 3
- Approved Electives 2 9

Senior Year

First Semester
- Phys 471 Theoretical Phys 3
- Phys 443 Optics 3
- Phys 461 Atomic and Molecular 3
- Phys 465 Intro Nuclear Phys 2
- Phys 410 Electronics 3
- Phys 499 Special Problems 1

Second Semester
- Phys 472 Theoretical Phys 3
- Phys 463 Phys Solid State 3
- Phys 412 Nuclear Instr 2
- Phys 499 Special Problems 1
- Approved Electives 2 7

1 Cpt S 201 is highly recommended.
2 Electives may be filled by additional mathematics such as Math 440, 441, 371, 372, 410, 460.

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

Transfer Students

Transfer students receive credit for equivalent courses taken elsewhere, but must meet the requirements for graduation listed above.

Preparation for Graduate Study

As preparation for work toward an advanced degree in physics it is strongly recommended that a student complete the above schedule of studies. He should also take at least one year of French, German, or Russian.

Department of Plant Pathology

Professor and Chairman of the Department, C. G. Shaw; Professors, G. W. Bruehl, J. W. Hendrix, S. O. Graham, S. B. Locke; Associate Professors, R. J. Cook, R. Duran, L. R. Faulkner, L. A. Hadwiger, J. A. Hoffmann, O. C. Maloy, J. D. Rogeri.

The courses offered in this department are designed to train students expecting to make plant pathology or mycology their professional field of specialization, and to provide supplementary training for students specializing in other biological fields, particularly agronomy, botany, horticulture, forestry, and entomology.

A professional career in plant pathology requires graduate training, and the four-year course outlined under the schedule of studies is fundamental to such graduate specialization. The graduate program prepares students for research or extension positions with the various state agricultural experiment stations, state and federal departments of agriculture, private industry, and for teaching or combinations of teaching and research in colleges and universities. The student who expects to become a professional plant pathologist is advised to include in his undergraduate studies fundamental courses in bacteriology, botany, chemistry, genetics, physics, and zoology even more than in plant pathology itself, leaving the specialization in the latter field to graduate study.

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 (Plant Pathology).

Description of Courses

PI P For explanation see Index under "Symbols"

329 General Plant Pathology 3 (2-3) I Prereq Bot 201. Classification, symptoms, cause, epidemiology, and control of diseases of economic plants.

331 Forest Pathology 3 (1-6) Prereq Bio S 103. Exercises on parasitic and non-parasitic diseases of forest and shade trees; relation of fungi to wood decay.

401 Diseases of Plants 3 I Prereq PI P 329. Representative types of plant diseases (noninfectious, bacterial, fungal, virus).

536 Physiology and Genetics of Parasitism Lab 2 (0-6) II 1971-72 a/y. Prereq Chem 564; Genet 362; c// in Pl P 533. Laboratory exercises on genetic and physiologic aspects of host-parasite interactions.

550 Field Mycology 3 (1-6) S 1971 a/y. Prereq Pl P 522, 523, or 524. Collection, identification, and preservation of parasitic and fleshy fungi; herbarium methods.

558 Genetics of Fungi 3 II 1971-72 a/y. Cooperative course taught at the University of Idaho.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 26 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester

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<tr>
<td>Math 101c Inter Algebra</td>
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<td>Bio S 103 Introductory</td>
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Second Semester

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<tr>
<td>Math 107 Precalculus</td>
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<td>Bio S 104 Introductory</td>
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Sophomore Year

First Semester

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<tr>
<td>Bot 201 Intermediate</td>
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<tr>
<td>Econ 201 Principles</td>
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<tr>
<td>Ag Elective</td>
<td>4</td>
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<td>ROTC or Elective</td>
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<td>P E</td>
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Second Semester

<table>
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<th>Course</th>
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<tr>
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<tr>
<td>Bact 101 Elementary</td>
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<tr>
<td>Ag Elective</td>
<td>4</td>
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<tr>
<td>Com, EngI, or Spe Elective</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
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</table>
Junior Year

First Semester
- Hum 101 Integrated 3
- Phys 101 General 4
- P 329 General 3
- Ag Elective 6

Second Semester
- Hum 102 Integrated 3
- Phys 102 General 4
- Biom 412 or Math 171 3-4
- Ag Elective 3-5

Senior Year

First Semester
- Jer 101 First Semester 4
- Bot 320 Plant Physiology 3
- Bot 232 Systematic 3
- Ag Elective 4-5

Second Semester
- Jer 102 Second Semester 4
- Com. Engl. or Spe Elective 3
- Hum or Soc S Elective 2
- Genet 301 Genetics 3
- Zool 222 Invertebrate 3
- Elective 2

Courses printed in Roman type are required or graduation, in italics are optional.

Preparation for Graduate Study
As preparation for work toward an advanced degree a student should have completed an undergraduate major in some field of plant science; 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.

The curriculum in general police administration provides a basic professional training program for career service in the police field. The technical police courses are superimposed on collateral offerings in related scientific fields and are interrelated with them so that the program represents an integrated preparation for a professional career in public service.

The student is also offered the opportunity for specialized study in the following areas: police records administration, scientific crime detection, instrumental deception detection, crime prevention, police communication systems, traffic administration, and commercial investigation. The student will determine, in consultation with the staff, the most desirable curriculum to achieve his objectives.

The department offers courses of study leading to the degrees of Bachelor of Science in Police Science and Administration and Master of Arts in Police Science and Administration.

Description of Courses

Polic For explanation see Index under "Symbols"

101 General Administration of Justice 2 I Administration of criminal justice in the United States; judicial procedures and the police system.

102 Police Organization and Management 3 I Principles applied to the police enterprise.

204 Police Record Systems 3 II Preparation and use of reports in operational procedures and planning.

285 Police Photography 3 (2-3) II 1971-72 a/y. Photography applied to police operations.

300 Police Patrol and Communications 3 Prereq Polic 102. Patrol organization and administration; distribution of the force.

310 Criminal Investigation and Identification 4 (3-3) II Prereq Polic 300. Application of scientific crime detection methods.

320 Commercial and Industrial Security 3 II 1971-72 a/y. Prereq Polic 300. Plant protection and industrial security; merchandising safety and security; credit and insurance investigative procedures.

400 Interrogation and Interview 2 I Prereq junior standing. Legal aspects of interrogation and interview; techniques of interrogation with reference to the polygraph.
401 Polygraph Laboratory 1 (0-3) II Pre-req Polic 400. Application of instrumentation to interrogation; the use and application of the polygraph.

405 Criminal Law and Procedures 3 II Pre-req Polic 300. Source and content; application to police responsibilities.

415 Traffic Regulation and Control 3 I Pre-req Polic 300. Open to Engr majors. Organization and functions of the police traffic division; traffic program.

420 Sociological Methods of Techniques 3 Same as Soc 420.

421 Personal Identification Techniques 4 (3-3) I Pre-req junior standing. Identification methodology: fingerprinting, portrait parl, property description, occupational marks, and other identification criteria.

425 Arrest, Search, and Seizure 2 II Analysis, explanation, and evaluation of court decisions relating to detention, search, and seizure.


475 Questioned Document Analysis 4 (3-3) I Pre-req junior standing. Examination and identification of questioned documents, admissibility as evidence; preparation and presentation for courtroom use.

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

502 Method and Theory of Police Interrelationships 2 II Interpretations of the administrative problems involved in inculcating attitudes relative to human relations in the police enterprise.

540 Advanced Topics in Police Administration 3 May be repeated for 6 hours credit. II Current topics or problems in the police service.

550 Advanced Criminalistics 2 II Application of scientific disciplines to the analysis of physical evidence.

570 Advanced Police Organization 3 I Pre-req Polic 300. Special phases of police management.

571 Contemporary Theories of Police Management 2 II Current problems of management in law enforcement.

572 Police Curriculum Analysis and Ad-
Transfer Students

Students planning to transfer to Washington State University should have completed the equivalent of the courses listed under the schedule of studies, exclusive of police science courses. Transfer students may be accepted for enrollment in police science not later than the end of their sophomore year.

Preparation for Graduate Study

As preparation for work toward an advanced degree, a student should have completed the following courses or their equivalent: Polic 300, 310, 468; Pol S 101; Psych 101; Soc 321, 361, 562.

Department of Political Science

Professor and Chairman of the Department, K. T. W. Swanson; Professors, P. L. Beckett, H. P. Castleberry; Associate Professors, P. E. Cunnea, J. D. Dowell, J. B. Gabbett, W. H. Peterson; Assistant Professors, P. M. Morgan, W. F. Mullen, T. Tsututani; Instructors, T. E. Cook, E. D. Rogers.

Courses in political science are offered in six principal fields: American government and politics, comparative government, public law, public administration, international politics and organization, 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.

Prelaw Studies

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 recommendations of the Association of American Law Schools, but students who choose other departmental options may also be eligible to attend law school if they meet admission requirements.

Although admission to law school usually requires a bachelor's degree, there are some exceptions to this rule. Students gaining admission after three years of prelaw study may receive a bachelor's degree from Washington State University if they meet the following conditions: (1) two years' residence at Washington State University; (2) completion before entering law school of substantially all course requirements in Option II, plus the general graduation requirements of the College of Sciences and Arts; (3) successful completion of the first year in a law school holding membership in the Association of American Law Schools; and (4) total credits, including first-year law school credits, equalling at least 120 semester hours.

Public Service

Government is now the nation's largest employer, with a work force (excluding public school teachers) of more than eight million persons. Many thousands of these officials, serving at home and abroad, 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 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.
Description of Courses

For explanation see Index under "Symbols"

General and Introductory Courses

Pol S

101 (S) American National Government 3

102 (S) Introduction to Comparative Politics 3 Nature of the state; fundamental problems of government and politics; an ideological and institutional comparison of Western 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

34 American Political Thought 3 I 1970-71 a/y. The genesis and development of political thought in the United States.

37 Classical Political Thought 3 I 1971-72 a/y. The development of political philosophy from the pre-Socratics to Machiavelli.

38 Recent Political Thought 3 II The development of political thought since Machiavelli.

30 The Scope of Political Science 3 I Prereq 12 hrs Pol S. Historical development and present status of the discipline; contemporary issues and future trends.

31 Research Methods in Political Science 2 II 1971-72 a/y. Prereq 12 hrs Pol S. Development of research designs; methods of data collection; analysis of data; research reports.

94 Seminar in Political Theory 2 May be repeated for credit. II 1970-71 a/y. Prereq 20 hrs Pol S.

Comparative Government

Pol S

30 (410) Major Governments of Western Europe 3 I Political institutions and processes of Great Britain, France, and the West German Federal Republic.

335 Asian Government and Politics 3 II Prereq Pol S 102. Analysis of major political institutions and processes in China, Japan, and the developing areas of South and Southeast Asia.

411 Government of Great Britain 3 I Prereq Pol S 102. Institutions and politics of Britain and selected members of the Commonwealth.

412 Government of the USSR 3 I Prereq Pol S 102. Institutions and politics of the Soviet Union.

413 Latin American Governments 3 II Governments, institutions, and politics of the republics of Latin America.

515 Comparative Politics: China and Japan 3 I 1970-71 a/y. Prereq Pol S 102 or 335. Political ideologies, institutions, and processes in Communist China and Japan.

516 Comparative Politics of South and Southeast Asia 3 I 1971-72 a/y. Prereq Pol S 102 or 335. Political ideologies, institutions, processes, and problems of developing areas of South and Southeast Asia.

550 Parliamentary Governments 3 II Comparative analysis of the institutions and policy-making processes of major parliamentary political systems.

595 Seminar in Comparative Government 2 May be repeated for 4 hours credit. I Prereq 20 hrs Pol S.

International Politics and Organization

Pol S

414 Inter-American Relations 3 I The Monroe Doctrine, Good Neighbor Policy, and Alliance for Progress; structure and role of the OAS.

421 International Law 3 II Law of peace, status of war, and pacific settlement.

423 International Organization 3 I The process, problems, and progress; emphasis on the United Nations.

425 (426) American Diplomatic History 1776-1900 3 I Same as Hist 425.

427 United States Foreign Relations 3 II Ends and means in foreign policy since 1914; organization, management, control, and current policy issues.

428 European Diplomacy 1848-1914 3 I 1970-71 a/y. Same as Hist 428.

429 European Diplomacy Since 1914 3 II 1970-71 a/y. Same as Hist 429.

590 Seminar in International Law and Diplomacy 2 May be repeated for 4 hours credit. I 1970-71 a/y. Prereq 20 hrs Pol S.
Public Policy Formation

Pol S

318 Political Parties 3 Prereq Pol S 101. Theories of parties; characteristics of American parties; impact of parties upon the electorate and electoral behavior.


417 The Electorare 3 II 1970-71 a/y. Prereq Pol S 101. Measurement and interpretation of electoral behavior; factors influencing the electorate; voter competence; representation of the electorate.

419 Politics of Pressure Groups 3 II 1971-72 a/y. Prereq Pol S 101. Organization and maintenance of special interest groups; their role and impact upon legislation, administration, and public opinion.

450 The Legislative Process 3 II 1970-71 a/y. Prereq Pol S 101. Role of legislatures in a democratic system; problems of representation; election and tenure of lawmakers; legislative organization and procedures.


591 Seminar in Public Policy Formation 2 May be repeated for 4 hours credit. II 1970-71 a/y. Prereq 20 hrs Pol S.

Public Administration

Pol S

440 Introduction to Public Administration 3 I Prereq Pol S 101. Basic theories of administrative organization, relationships, and behavior.

443 Administrative Law and Regulation 3 I Prereq Pol S 101. Governmental controls over the economy, focusing upon the administrative regulatory processes, their environment, and techniques.


446 Fiscal Administration in Government 3 II 1971-72 a/y. Prereq Pol S 101. Fiscal aspects of public administration; the budget as an instrument of planning and control; organizing to insure fiscal accountability.

455 The Chief Executive 3 I 1970-71 a/y. Same as Pol S 455 above.

560 State Government and Administration 3 II 1971-72 a/y. Prereq 12 hrs Pol S. Institutions, processes, and functions of American state governments; their responses to modern needs in an evolving federal system.

565 The Government of Metropolitan Areas 3 II 1970-71 a/y. Prereq 12 hrs Pol S. Political processes, roles, institutions, and problems of metropolitan areas.

592 Seminar in Public Administration 2 May be repeated for 4 hours credit. II 1970-71 a/y. Prereq 20 hrs Pol S.

Public Law

Pol S

300 The American Constitution 3 Prereq Pol S 101. Federal system; executive, legislative, and judicial powers; civil and political liberties; regulation of commerce; taxation.

402 Civil Liberties 3 II Prereq Pol S 101. Origin and development of civil liberties; responsibility of the branches of government and the people for their maintenance.


443 Administrative Law and Regulation 3 I Same as Pol S 443 above.

593 Seminar in Public Law 2 May be repeated for 4 hours credit. I 1971-72 a/y. Prereq 20 hrs Pol S.

Problems, Seminar, and Research and Thesis

Pol S

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

502 Seminar in the Teaching of Political Science 1 May be repeated for credit.

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

600 Research, Thesis, or Examination Variable credit.
Schedule of Studies

At least 39 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

A seminar is required of candidates for graduation with honors.

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 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 the graduation requirements of the College of Sciences and Arts and should have taken:

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<th>Hours</th>
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<tr>
<td>Pol S 101 or 198, 102 and 206 or 222</td>
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<td>Econ 201 or 102 and 203</td>
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<td>Psych 101</td>
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<td>Phil 101 or 201</td>
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Junior Year

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<tr>
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Senior Year

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*One course in American history, plus one course from Hist 101, 102, 120 or 121.

Option II. Prelaw

Requirements for graduation include 24 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 the graduation requirements of the College of Sciences and Arts and should have taken:

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Junior Year

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<td>Pol S Elective</td>
<td>6</td>
</tr>
<tr>
<td>Econ 320 Money and Bank</td>
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Senior Year

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>Pol S Elective</td>
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<td>Pol S Elective</td>
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<tr>
<td>Elective</td>
<td>12</td>
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</table>

*One course in American history plus one course from Hist 101, 102, 120 or 121.

Option III. Public Administration

This program is designed to provide a broad foundation in political science and related subjects on which can be built either a public service career or graduate specialization in public administration.

Within the limits of the basic requirements outlined, special course patterns can be arranged for students particularly interested in such specialties as city management, city planning, and public personnel administration.

Requirements for graduation include 30 hours in Pol S distributed among fields as follows: at least two advanced courses in public administration (including Pol S 440), two in public policy formation, and one in public law (Pol S 300). Also required are B A 230, Econ 340, a course in statistics (Soc 321, B A 315, 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 the graduation requirements of the College of Sciences and Arts and should have taken:

\[
\begin{array}{ll}
\text{Hours} & \\
\text{Pol S 101 or 198, and 206} & 6 \\
\text{Econ 201 or 102 and 203} & 4-6 \\
\text{Hist Elective*} & 6 \\
\text{Anth 101 or Soc 101} & 3 \\
\text{Psych 101} & 3 \\
\end{array}
\]

**Junior Year**

**First Semester**

\[
\begin{array}{ll}
\text{Hours} & \\
\text{Pol S 300, 440} & 6 \\
\text{B A 230 Prin Acctg} & 4 \\
\text{Elective} & 5 \\
\end{array}
\]

**Second Semester**

\[
\begin{array}{ll}
\text{Hours} & \\
\text{Pol S Elective} & 6 \\
\text{B A 315, Soc 321, Math 360, or Psych 311} & 3-4 \\
\text{Engl 201 or 301} & 3 \\
\text{Elective} & 2-3 \\
\end{array}
\]

**Senior Year**

**First Semester**

\[
\begin{array}{ll}
\text{Hours} & \\
\text{Pol S Elective} & 6 \\
\text{Econ 340 Pub Fin Tax} & 3 \\
\text{Elective} & 6 \\
\end{array}
\]

**Second Semester**

\[
\begin{array}{ll}
\text{Hours} & \\
\text{Pol S Elective} & 6 \\
\text{Elective} & 9 \\
\end{array}
\]

*One course in American history plus one course from Hist 101, 102, 120, or 121.

**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 General University Requirements for the College of Sciences and Arts, students must include Psych 101, Hist 120, 121. Econ 201 or 102-203 are strongly recommended.

Department requirements are:

a) 26 hours in Political Science, including Pol S 206, 222, 300, 318.

b) a teaching minor in history consisting of 18 hours, including Hist 120, 121, 455 and 9 additional hours, at least 3 of which must be upper division. Hist 320, 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 cata-

log. English or speech is strongly recommended.

d) 24 hours in education consisting of Educ 101, 201, 301, 401, 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 161, 263, 480, 481; Bact 101, 201.

Students undertaking the above program must add education as a second major, preferably during their sophomore year, but before they enroll in education courses above Educ 201.

**Preparation for Graduate Study**

Students who have had basic undergraduate training in political science while majoring in such subjects as economics, business administration, history, police science, 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**

Professor and Adviser, H. L. Eastlick; Associate Professor, J. H. Larsen, Jr.; Assistant Professor, R. J. Adkins.

Preparation for dental school requires a minimum of two years of college work; however, only a few exceptional students are accepted with this 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' work 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 a satisfactory scholastic record, satisfactory scores on the dental college admissions test, and the possession of personal qualifications necessary for the study of dentistry.

Dental schools welcome applications from students who have majored in any of the departments in the College of Sciences and Arts providing they have met the minimum requirements stated above. The predental adviser usually is able to suggest a schedule of studies to meet the interest and needs of the individual student.

For a predental program which leads to the Bachelor of Science degree in Zoology consult the Schedule of Studies under the Premedical Curriculum.

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### Premedical Curriculum

**Professor and Advisor, H. L. Eastlick; Associate Professor, J. H. Larsen, Jr.; Assistant Professor, R. J. Adkins.**

Preparation for medical school requires a minimum of three years of college work; however, only outstanding 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. Since there are more than 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 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 course in quantitative analysis.
5. One year of college physics.
6. One year (and preferably two) of college biology.
7. A reading knowledge of a modern foreign language, German, French, or Russian.

8. 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, preferably the year 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 the minimum entrance requirements of that school, attainment of a superior scholastic record, satisfactory scores on the medical college admissions test, and possession of personal qualifications necessary for the study of medicine. Most schools require applicants to appear for a personal interview. In addition, letters of recommendation from three or more college teachers must strongly support the applicant.

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, and engineering. Adequate latitude exists in the medical school requirements so that the adviser usually is able to suggest a schedule of studies to meet the needs of the individual student.

The following curriculum is recommended for the premedical student who wishes to secure the Bachelor of Science degree in Zoology.

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### Schedule of Studies

At least 20 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>Bio S 103 Introductory</td>
<td>4</td>
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<tr>
<td>Chem 105 Principles</td>
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<tr>
<td>Engl 101 Composition</td>
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</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
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<td>P E</td>
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</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Bio S 104 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Chem 106 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Engl 108 Intro to Lit*</td>
<td>3</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Sophomore Year

First Semester
- Phys 101 or 201
- Chem 241 Organic
- Zool 220 Vertebrate
- Soc 101 Introduction
- ROTC or Elective
- P E

Second Semester
- Phys 102 or 202
- Chem 242 Organic
- Chem 243 Organic Lab
- Zool 222 Vertebrate
- Engl 201 Inter Comp
- ROTC or Elective
- P E

Junior Year

First Semester
- Zool 320 Vert Morph
- Psych 101 Principles of Behavior
- Zool 352 Zoophysiology
- Hum 101 Integrated

Second Semester
- Phil 101 Introduction
- Chem 217 Quant Anal
- Econ 201 Principles
- Hist 120 American

Senior Year

First Semester
- Genet 301 or Approved Elective
- Zool 420 Micro Anat
- Elective
- For L or Elective

Second Semester
- Bact 201 Gen Microbiology
- Elective
- Zool 393 Seminar
- For L or Elective
- Ecology Elective

* Or any course in the humanities or social sciences which meets the General University Requirements for Graduation (see requirements for the College of Sciences and Arts).

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

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Department of Psychology


Psychology is the scientific study of human and animal behavior. Through the study of this field the student becomes acquainted with the systematic nature of human behavior, with techniques for investigating it, and with theories of its development.

The undergraduate offerings are designed both for majors and for students in other departments who need a background in those aspects of psychology which are related to their respective fields. The undergraduate degree program is designed for three groups of students: those with an interest in psychology as part of a liberal education; those who plan to use their training in related vocations such as work in personnel, government service, and youth organizations; and those preparing for graduate study in psychology. The department also offers courses leading to a teaching minor in psychology for secondary school teaching.

The graduate program leads to advanced degrees for qualified students who are interested in eventual employment as psychologists in college teaching, research, or professional service. The course of study for the Doctor of Philosophy degree may be directed toward a specialization in clinical psychology or in one or more of the areas of "general 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.

Description of Courses

Psych For explanation see Index under "Symbols"

100 Study and Adjustment Skills 1 (0-3)
Individual diagnosis and reeducation
in areas influencing personal and scholastic effectiveness in college.

101 [S] Principles of Behavior I 3 PREREQ FOR ALL COURSES LISTED BELOW EXCEPT PSYCH 198. Introduction to general psychology.

107 Areas of Psychology 3 II Animal, social, legal, abnormal, and child.

198 [S] Psychology Honors 3

201 (236) [S] Principles of Behavior II 3 Second semester of general psychology. Personality development, social learning, social behavior, abnormal behavior; applied psychology.


306 Industrial Psychology 3 II Job analysis, merit ratings; personnel testing and selection, work conditions, training, human engineering; consumer psychology.

307 Human Factors 3 II Prereq Psych 101 or Engr major. Human capabilities and limitations as related to perceptual motor tasks, decision making and information handling; systems design.

311 Elementary Statistics in Psychology 3 Prereq Math 101C or equivalent. Descriptive statistics, probability, and inference.

321 Psychology of Adjustment 2 or 3 Minor behavior problems and non-psychotic types of adjustment.

325 Seminar in Psychology 2 or 3 May be repeated for credit. Prereq junior or senior in Psych.

340 (270) Neural Bases of Behavior 3 II Functional relationship between nervous system and behavior; integrated organ systems, sensory processes, and investigative procedures.


360 Developmental Psychology I 3 I Prereq Psych 201. Developmental changes in intellectual, emotional, motor, and social behavior from early infancy to adolescence.

361 Developmental Psychology II 3 II Prereq Psych 360. Developmental changes during the adolescent period; problems of adjustment.

362 (333) Development of Deviant Behavior 3 Prereq Psych 201. Types, their causes, outcomes, therapies, and preventive techniques.


390 (291) Operant Behavior 3 I Principles; interaction of man with his environment; the bases for constructing new environments.

431 Theories of Personality 3 II Prereq Psych 201; one additional Psych course.


480 (484) Sensory Processes 3 (2-3) I Prereq Psych 285, 311. Principles of sensation and perception as an area of experimental psychology; vision and auditory systems.

490 (491) Psychology of Learning 3 II Prereq Psych 285, 311. Techniques, findings, and theories on learning and retention.

491 Psychology of Learning Laboratory 1 (0-3) II Prereq Psych 285, 311; c// in 490. Research on techniques, findings, and theories on learning and retention.

498 Research Participation 2-4 May be repeated for 8 hours credit. Participation in current research by departmental faculty.

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

501 Seminar in the Teaching of Psychology 1 May be repeated for credit.


511 Seminar in Quantitative Psychology 3 II Prereq Psych 567.

512 Measurement in Psychology 3 (2-3) II Prereq Psych 311. Theory, evaluation, and use of psychological tests.

520 Theoretical Foundations of Psychotherapy 3 I Prereq Psych 535. Not open to first-year graduate students.

521 Behavior Modification 3 (2-3) II 1970-71 a/y. Prereq Psych 491, 520. Learning principles applied to modifying behavior of children and adults in institutions, clinics, and schools.

525 Counseling Method 2 (1-3) May be repeated for credit. Prereq Psych 520. Supervised practice in the Student Counseling Center.

526 Counseling Method 1 (0-3) May be repeated for credit. Same as Psych 525.

530 Professional Problems of Psychology 1 May be repeated for 2 hours credit. Prereq Psych 535. Ethical problems and philosophical issues faced in practice of psychology.
### Schedule of Studies

A minimum of 24 hours in psychology is required for the bachelor's degree. At least 30 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

The psychology courses should be taken as indicated in the schedule of studies. Students undertaking a major later than the second semester of the sophomore year should consult with the department chairman concerning an alternate schedule.

#### Freshman Year

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<tr>
<th>Semester</th>
<th>Course</th>
<th>Hours</th>
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<tr>
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<td>Engl 101 or Elective</td>
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<tr>
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<td>Psych 101 or Soc 101</td>
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<td></td>
<td>Soc S Elective</td>
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<td>Hum Elective</td>
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<tr>
<td>Second Semester</td>
<td>Engl 101 or Elective</td>
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<tr>
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<td>Psych 101 or Soc 101</td>
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<td>Science Elective</td>
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<td>Elective</td>
<td>7</td>
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#### Sophomore Year

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<th>Course</th>
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<tr>
<td>First Semester</td>
<td>Psych 201 or 285</td>
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<td>Math 201 Finite Math</td>
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<td></td>
<td>Soc S Elective</td>
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<td>Hum Elective</td>
<td>3-4</td>
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<td>ROTC or Elective</td>
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<tr>
<td>Second Semester</td>
<td>Psych 201 or 285</td>
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<td>Zool 251 Intro Hum Physiol</td>
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<td>Phil 101 Introduction</td>
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#### Junior Year

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<tr>
<td>First Semester</td>
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<td>3-6</td>
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<tr>
<td></td>
<td>Elective</td>
<td>8</td>
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<tr>
<td>Second Semester</td>
<td>Psych Elective*</td>
<td>3-8</td>
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<tr>
<td></td>
<td>Elective</td>
<td>9</td>
</tr>
</tbody>
</table>
Through suitably chosen electives, majors may prepare themselves for occupational goals such as the following: (1) preprofessional training for later graduate work (in sociology or other fields where knowledge of group functioning is important); (2) service in federal, state, or local government as junior research technicians; (3) teaching social studies at the secondary level; (4) a variety of social work positions, such as in social welfare agencies or in adult and juvenile correctional systems.

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 Concepts, theories, and methods of the sociological perspective; nature of groups; social organization, culture, socialization, social change. PREREQ FOR ALL COURSES LISTED BELOW EXCEPT SOC 150, 151, 160, 198, 380.

150 (120) [S] Problems of Marriage 3 For freshmen and sophomores only. Marriage customs and their functions; premarital patterns; changing marriage mores; practical aspects of marriage.

151 (121) [S] Problems of Marriage 3 For juniors and seniors only. Same as Soc 150.

160 (102) [S] Contemporary Social Problems 3 Social disorganization, personal deviance, and problem aspects of modern society; facts and theories concerning etiology and control.

198 [S] Sociology Honors 3

220 Introduction to Social Research 3 Nature of research process; elementary problems of design; data collection and analysis; interpretation of research.

270 (215) [S] Social Interaction and the Individual 3 The development of human nature within socio-cultural systems; group processes, self concept, attitudes, symbolic interaction.

321 (382) Social Statistics I 4 Prereq Soc 220. Levels of measurement; measures of central tendency, dispersion, and association; probability, the normal curve, and statistical inference.
330 (375) [S] Communities and Social theories of the community; research on their relationship to modern society; specific problems of community behavior and change.

340 (314) [S] Social Stratification Major dimensions of social stratification systems; class, status, and power; comparative materials: England, Australia, and Sweden.

341 (327) [S] Sociology of Religion Social sources and significance of religious beliefs and behavior; social organization of religious groups, and religion and social change.

342 [S] Political Sociology Sociological analysis of political institutions and power structures; social and cultural basis of political behavior.

343 (328) [S] Sociology of Professions and Occupations Sociological aspects of occupational choice, preparation, and entry; occupational roles; job mobility; occupational status and career positions.

350 Social Psychology (2-3) Same as Psych 350.

351 (320) [S] The Family Nature of the family; the family in modern American society; family dynamics in relation to personality, social change, and social values.

360 [S] Sociology of Deviance Sociological approaches to deviance; historical and contemporary theories and deviance issues.

361 (330) [S] Criminology Crime and society; theories of criminality; types and trends of crime; characteristics of criminals; social control; criminological controversies.

362 (331) [S] Juvenile Delinquency Sociological perspectives on delinquency; delinquent gangs and sub-cultures; delinquency causation and control; police, justice, and corrections as they affect youth.

370 (311) [S] Public Opinion and Propaganda The role of public interest groups; the press; propaganda and censorship; techniques in democracies and dictatorships.

371 (335) Small Groups Analysis Prereq 6 hrs Soc. Sociology of small groups; theory and research relating to structure and functions; leadership, control, and change.

373 [S] Sociology of Mass Communication Theories of mass communication; communication as social process; media and socialization; violence and the media.

374 (413) [S] Collective Behavior and Social Movements Sociological basis of panics, riots, fads, and fashions; collective behavior as basis of social change and development of social movements.


381 [S] World Minority Problems Cross-cultural perspective on minority group problems; minority group adaptation to prejudice and discrimination.

410 (490) History and Principles 6 hrs Soc. The works of leading sociological theorists; major trends in sociological thought.

420 (481) Sociological Methods and Techniques Prereq Soc 220, 321. The nature of sociological research procedures; sampling, measurement, statistical research design, and data analysis; scientific writing.

421 (482) Social Statistics II Prereq Soc 220, 321. Probability theory, basic theory of inference, goodness of fit, and one-sample tests; two-sample parametric and non-parametric tests.

430 (425) World Population Overview of population study and its relation to other fields of inquiry; fertility, mortality, migration, urbanization, social and economic variables.

431 Urban Sociology Patterns and consequences of urban life; cross-cultural perspectives on social organization of cities.

440 (421) Sociology of Complex Organizations Theories of complex organization; analysis of recurrent organizational processes; review of literature.

446 (460) Medical Sociology Social and cultural factors in illness; organization and distribution of medical services.

451 (420) Comparative Family Systems Prereq 6 hrs Soc or Anth. Cross-cultural analysis of family institutions.

460 (430) Adult Corrections Facilities, agencies, processes, and strategies for the correction of adult offenders.

461 (431) Juvenile Corrections Treatment of juvenile offenders; prevention of juvenile delinquency.

463 Sociology of Poverty Examination
of the social and psychological characteristics associated with poverty; effects of poverty on personality; anti-poverty programs.

470 (450) Social Structure and Personality 3 Prereq Soc 270 or 350. Effects of social structures on the development of personality; examination of personal and social variables in predicting behavior.

480 (322) The Sociology of Intergroup Relations 3 Prereq Soc 380. Dominant-minority relations in cross-cultural perspective; prejudice, discrimination, assimilation, conflict, and other modes of contact.

491 (495) Seminar in Sociology 1-3 May be repeated for 6 hours credit.

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

510 (500) History of Social Thought 3 Society from the 1500’s to end of 19th century; development of science in 17th and 18th centuries as related to growth of sociology.

511 (501) Contemporary Sociological Theory 3 Sociological origins of concepts, approaches, and general theories relevant to the field today.

512 (579) Theory Construction and Formalization 3 Testing; formalization of theoretical systems; adaptation of general models to specific problems.

514 (483) Logic of Sociological Inquiry 3 Evaluation of issues from philosophy of science relevant to social research.

515 Social Change 3 Theories of social change; modernization and its consequences; industrialization; directed social change.

521 (580) Social Statistics III 3 Prereq Soc 321, 421. Variance and covariance; multiple and partial correlation and regression; factor analysis; advanced experimental design.

522 (587) Measurement in Sociology 3 May be repeated for credit. Prereq Soc 421. Sampling theory, principles of scaling, and the administration of research.

530 Demography 3 Prereq Soc 430. Advanced demography; relation to other fields; economic and social determinants of fertility, mortality, migration, and urbanization.

531 (575) Human Ecology 3 Prereq Soc 431. Social adjustments to physical space; effects of environmental factors; problems and theory of ecological research.

540 (513) Complex Organizations 3 Elements of organization; methodologies for studying organizations; problems of organizational theory.

541 (512) Sociology of Education 3 Interpretations of society as they affect roles of educational workers; sociological perspectives on the problems of education.

542 (523) Theories of Social Stratification 3 Marx, Dahrendorf, Weber, Sorokin, Mills, Pareto; problems of stratification research; social class and social policy.

543 (528) Sociology of Work 3 Sociological literature on professions and other occupations; adequacy of concepts and research methods.

544 Sociology of Religion 3 Role of religion in social structure process and change; analysis of religious behavior.

550 Advanced Social Psychology 3 (2-3) Same as Psych 550.

554 (520) Family Theories and Theory Construction 3 Review of recent attempts to formulate family theories; students prepare preliminary versions of family theories.

560 (530) Problems in Criminological Theory 3 Development of theories of crime and delinquency; new issues in criminology.

561 Sociology of Law 3 Examination of social factors affecting the development and maintenance of legal structures and the processes of administration of justice.

565 Corrections Theory and Research 3 Theory and research pertaining to the correction of criminals and delinquents.

566 (590) Seminar in Deviant Behavior 2 May be repeated for credit. Addiction, sex deviance, violence, suicide, alcoholism.

571 (535) 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 (515) Socialization 3 Theories of childhood and adult socialization; personality development; symbolic interaction; learning; agents of socialization.

580 (522) Race and Minority Relations 3 Survey and assessment of theory and research on intergroup relations.

590 (595) Seminar in Sociology 3 May be repeated for 6 hours credit.
Soc 220 is required. It should be taken as soon as possible. Soc 321 and 410 must be completed during the junior and senior years.

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 is advised to complete the requirements specified under the first two years of the General Sociology Option.

During the junior and senior years, the student must complete Soc 321, 410, and 420 and is advised to complete Math 201, 202; Phil 201, 380, 425; Cpt S 201, 320.

Option III. Social Welfare

The following curriculum is intended for students who have a career interest in the field of social welfare including corrections. Its objective is two-fold: to provide a broad foundation upon which professional education and in-service training can be built, and to provide an orientation to specific problems, methods, and skills pertinent to helping people by means of established social welfare and correctional agencies.

The student is advised to complete the requirements specified for the first two years under Option I, plus S W 290; Psych 201; Polic 101.

During the junior and senior years, the student must complete Soc 321, 410 and is advised to complete S W 390, 490; Soc 361, 362 or 460, 461; Psych 333; Anth 358; Polic 405 or 465.

Preparation for Graduate Study

As preparation for work toward an advanced degree a student should have completed not less than 18 hours in sociology, including Soc 321 and 420 or their equivalents.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Soc 160 Social Problems</td>
<td>3</td>
</tr>
<tr>
<td>Soc 220 Introduction to Social Research</td>
<td>3</td>
</tr>
<tr>
<td>Soc 270 Social Interaction and the Individual</td>
<td>3</td>
</tr>
<tr>
<td>Hist 101, 102 or 120, 121</td>
<td>6</td>
</tr>
<tr>
<td>Pol S 101 American Government</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Anth 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>
soils

1. W. Smith, Adviser. For instructional staff use Department of Agronomy.

The development of an understanding of properties and uses of soils is the goal of this curriculum. It trains students to work out practical management problems, and should provide the background essential for those interested in 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

soils For explanation see Index under "Symbols"

201 Soils 3 (2-3) Prereq Chem 102. Chemical, physical, and biological properties of soils.

301 Soil Management 2 II Prereq Soils 201. Fertilizers, amendments, and reclamation practices as factors of soil productivity; soil and water conservation.

400 Soil Chemistry 2 II Prereq Soils 201. Chemical aspects of soil use and modification; ion movements; nutrient cycling and availability; salt balance interpretation; water quality; pollution.

401 Soil Analysis 3 (1-6) II Prereq Soils 301 or 400 or C/. Chemical characterization of soils for diagnostic purposes. Students supply soil samples and obtain directions early for sampling.

404 Soil Morphology and Classification 3 (2-3) II Prereq Soils 201. Soil profiles; soil-forming processes; systems of classification. Field trips required.

408 (308) Forest Soils 3 (2-3) I Prereq Soils 201; Geol 101 recommended. Morphology and characteristics of forest soils; soil science applied to forestry.

411 Physics and Hydrology of Soils 3 (2-3) I Prereq Math 107; Soils 201. Water retention and transport in soil; structure, aeration, and temperature in relation to plant growth.

416 (316) Air Photo Interpretation 2 (0-6) Principles of stereophotogrammetry and interpretation. Students supply photos for projects in special applications.

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

500 Advanced Soil Chemistry 3 II 1970-71 a/y. Prereq Soils 400; Chem 217. Soil as a chemical system; organic-inorganic complexes; surface phenomena; ion exchange reactions and equilibria.


502 Soil Fertility 3 I 1971-72 a/y. Prereq Soils 400; 401. Nutrient availability; its evaluation and relation to soil characteristics.

503 Soil Geography 3 (2-3) I 1970-71 a/y. Prereq Soils 404 or 408. Occurrence of soil groups related to environment; climatic regions and parent materials stressed. Field trips required.

505 Soil Mineralogy 3 (2-3) II 1971-72 a/y. Prereq Chem 217. Structure, properties, and identification of major clay minerals; solution equilibria and clay mineral weathering.

506 Soil Organic Matter 2 I 1970-71 a/y. Prereq Soils 400; Chem 240; Bact 201. Formation, chemical properties, and significance of the soil organic fraction. Cooperative course taught at the University of Idaho.

511 Soil Physics 3 (2-3) II 1971-72 a/y. Prereq Chem 332; Soils 411. Physics and physical chemistry of the soil- water system.

512 Seminar 1 May be repeated for credit. Current literature and research.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 25 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>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
</tr>
<tr>
<td>Geol 101 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Plant Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
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<tr>
<td>P E</td>
<td>1/2</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>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Spe 112 Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>ROTC or Elective</td>
<td>2</td>
</tr>
<tr>
<td>P E</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Sophomore Year

First Semester  
Chem 106 Principles  4  
Bact 201 Gen Microbiology  4  
Phys 101 General  4  
Math 172 Calculus II  4  
ROT C or Elective  2  
P E  1/2  

Second Semester  
Chem 217 Quant Analysis  4  
Phys 102 General  4  
Bio S 103 Introductory  4  
Soils 201 Soils  3  
ROT C or Elective  2  
P E  1/2  

Junior Year

First Semester  
Chem 240 Organic  4  
Ag M 344 Irrig and Drainage  3  
Soils 301 Management  2  
Hum or Soc S Elective  3  
Elective  3  

Second Semester  
Bot 201 Intermediate  4  
Soils 400 Chemistry  2  
Soils 401 Analysis  3  
Elective  6  

Senior Year

First Semester  
Bot 320 Plant Physiology  3  
Soils 411 Phys and Hydr  3  
Hum or Soc S Elective  3  
Comm, Engl, or Spe Elective  3  
Elective  3  

Second Semester  
Soils 404 Morphology  3  
Engl Elective  3  
Plant Science Elective  3  
Soils 416 Air Photo  2  
Elective  4  

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

Preparation for Graduate Study

As preparation for work toward an advanced degree a student should have completed Bact 201; Bot 320; Geol 101; Math 172; 15 hours of soils; 24 hours of chemistry and physics; courses in agronomy, forestry, or horticulture. A modern foreign language is recommended.

Department of Speech


The Department of Speech offers courses in four distinct areas in which a student may major: rhetoric and public address, speech pathology and audiology, theatre arts and drama, and speech education. Majors and nonmajors may select courses from any of the four areas. The nonmajor may select courses designed to improve his communication skills in speech communication, oral interpretation, and theatre arts. He may also select courses designed to give him a greater understanding of the speech arts and sciences: theatre, public address, speech pathology, audiology, phonetics, and speech education.

The major in speech completes one of several course sequences which prepare the student for teaching, professional practice, continued professional education, or vocations in sales, advertising, public relations, and related fields. Some majors go on to related professional education such as law school. Practical experience is coordinated with theoretical training through the forensics program, university theatre program, speech and hearing clinic, and student teaching.

The Speech and Hearing Clinic offers students free diagnostic and treatment services related to speech and hearing problems.

The department offers courses of study leading to the degrees of Bachelor of Arts in Speech, Master of Arts in Speech, Master of Arts in the Teaching of Speech, and Doctor of Philosophy.

The department participates in offering a course of study leading to the degree of Master of Arts in Child Development.

Description of Courses

For explanation see Index under "Symbols"

General Introductory and Service Courses

SPE 101 Principles of Interpersonal Communication 3 Communication and rhetorical theories; public speech as a paradigm of interpersonal communication.

112 [II] Fundamentals of Speech 3 (2-3)
160 Introduction to Theatre Arts 3 Stage, screen, and radio; principles of appreciation.

205 Introduction to Speech Pathology 3 (2-3)

206 Recreational Dramatics 3 Not open to Spe majors and those who have had Spe 364. Techniques of organizing and staging drama activities for all age groups: oral reading, story telling, choral reading, and puppetry.

250 Interpretation 3 Documents, speeches, short stories, and poetry.

251 Interpretation 3 Prereq Spe 250. Classical and modern poetry, drama, and speeches.

Speech Education

Spe

435 Speech Pedagogy 3 Prereq 8 hrs Spe. Principles, history, philosophies, and methods of speech education; objectives, materials, and procedures in directing class and co-curricular activities.

535 Seminar in Speech Education 1 May be repeated for 2 hours credit. Research in current problems in the area of speech education.

571 The Psychology of Speech 3 II 1971-72 a/y.

586 Seminar in Human Communication Theory 3 May be repeated for credit. I Introduction to the systems, functions, and principles of influential communication theories; classification, description, analysis, and solution of communication problems.

Rhetoric and Public Address

Spe

231 Argumentation 3 (2-3)

234 Parliamentary Procedure 2

235 Principles of Group Communication 3 (2-3) Prereq sophomore standing.

301 (320) Advanced Public Speaking 3 Prereq Spe 101 or 112.

325 General Semantics 3 Use of language to influence human behavior; language in problem solving and as a means of resolving conflict.

331 Deliberative Decision-Making 3 I The theory and structure of debate as a means of decision-making.

401 (421) Persuasion 3 Prereq Spe 301.

423 History and Criticism of British Public Address 3 I 1970-71 a/y. Prereq Spe 301. Significant political issues, addresses, and spokesmen in Great Britain from 1750.

424 History and Criticism of American Public Address 3 II 1971-72 a/y. Introduction to the major periods and speakers in American public address.

425 Contemporary Public Address 3 II Public discourse in contemporary social, political, and economic affairs.

520 History and Theory of Rhetorical Criticism 3 Prereq Spe 401 or 423. From early Greek through 18th century; Plato, Aristotle, Cicero, and Quintilian.

525 Rhetorical Theory to 1700 3 I Men and movements in rhetorical theory from its beginning to the 17th century.

526 Rhetorical Theory Since 1700 3 II Men and movements in rhetorical theory since 1700.


585 Seminar in Rhetoric and Public Address 3 May be repeated for credit. Research and study in a specific area of rhetoric and public address.

Speech Pathology and Audiology

Spe

370 Clinical Methods I 3 Prereq Spe 205. Organization of the speech pathology program in the school setting; methods of treatment for the speech handicapped school child.

371 Development of Speech and Language in Childhood 3 I The normal development of language and speech; introduction to speech and language disorders in children and the role of the non-specialist.

375 Speech Science and Phonetics 3 Prereq Spe 205.


472 Audiology 3 Prereq Spe 205. Physiology and testing of hearing, hearing aids, speech reading, auditory training, and speech conservation.

473 Communication Disorders of the Neurologically Handicapped and Mentally Retarded 3 Prereq Spe 370. Diagnosis and therapy procedures for speech, language, and learning disabilities associated with brain dysfunction and mental retardation.

474 Stuttering 3 Theories and therapies of stuttering in the United States and Europe.
Clinical Practice 1 (0-3) to 3 (0-9)  
May be repeated for 6 hours credit.  
Prereq Spe 370. Working with speech  
handicapped; formulation of case  
histories and use of clinical equipment.

Aural Rehabilitation 3  
Theories and methods involved in the aural  
rehabilitation of the hard of hearing, including  
auditory training and lipreading.

Diagnosis and Appraisal of Speech  
Disorders 3 I 1971-72 a/y.  
Prereq Spe 375, 471, 473. Principles, techniques,  
and materials involved in exploring the nature of speech  
disorders for planning a program of therapy.

Design of Human Communication  
Research 3 II Analysis and design of experiments in  
audiology, speech pathology, speech education, public  
address, and theatre.

Advanced Theories and Methods  
in Audiology 3 II 1971-72 a/y.  
Prereq Spe 205, 472.

Clinical Methods II 3 I Prereq  
Spe 375, 471, 474. Treatment procedures for complex disorders of speech  
and language.

Seminar in Speech Pathology and  
Audiology 3 May be repeated for credit.  
II Exploration of ideas derived from current writings and research in  
speech pathology and audiology.

Theatre Arts and Drama

Beginning Acting 3 Principles and  
techniques; use of body, mind, and  
voice for stage.

Acting 3 Prereq Spe 260. Representative  
dramatic scenes; gesture, movement,  
timing, sustaining emotion,  
characterization, and play analysis.

Technical Theatre Arts 3 (1-6) May  
be repeated for credit. Planning and  
executing scenery and costumes;  
designing and constructing; basic  
lighting for the stage.

Stage Make-Up 1 (0-3) Stage, movie,  
and television make-up problems.

Fundamentals of Play Directing 3  
Prereq Spe 260. Major theories of directing;  
principles of movement, composition,  
and tempo; working with actors;  
presentation of short scenes.

Puppet Theatre 3 (2-3) A historical  
and modern study of puppetry applicable to  
educational and traditional aims.

Creative Dramatics 3 Prereq Spe 112  
or 260. Not open to students who have  
had Spe 206. Developing original  
dramatizations with children.

Advanced Interpretative Reading 3  
Prereq Spe 251 or 261. Oral communication  
of prose, poetry, and drama.

Play Directing 3 (2-3) II Prereq Spe  
361. Full length playscripts for  
production; structure of the written play for  
production; preparation and public  
presentation of a play.

Producing and Directing School Plays  
2 or 3 Primarily for teachers and directors.

Stage Lighting 2 (1-3) Prereq Spe 262,  
361, or 462. Analysis of problems:  
light plots and color psychology;  
instrument use, board operation, and  
control; applications for amateur or  
professional use.

Children's Theatre 3 II 1971-72 a/y.  
Prereq Spe 260, 262, or 361. Specific  
problems in theatre for children.

History of the Theatre 3 The physical  
theatre and drama from primitive  
times to 1700.

History of the Theatre 3 Continuation  
of Spe 465. The physical theatre  
and drama from 1700 to present.

Contemporary Theatre and Drama 3  
The development of contemporary  
theatre and drama.

Advanced Play Directing 3 (2-3) Prereq  
Spe 361. Experience in a directing  
project; prompt book.

The Theory of Drama 3 I The nature  
and structure of drama.

The Forms of Drama: Tragedy 3 II  
1971-72 a/y. The development of  
tragedy from the origins to the present.

Seminar in Theatre 3 I May be repeated for  
credit. Research in a specific area of  
theatre.

American Theatre and Drama I 3 I  
1971-72 a/y. The American theatre  
and drama from colonial origins.

American Theatre and Drama II 3 II  
1971-72 a/y. The American theatre  
and drama from 1850 to the present.

Problems and Research and Thesis

Special Problems 1-4 May be repeated  
for credit.

Research Methods in Speech 3 Theory,  
methods, and practice of research in  
rhetoric and public address, theatre,  
speech pathology, and speech educa-  
tion.
599 Special Problems 1-4 May be repeated for credit.
600 Research, Thesis, or Examination Variable credit.

General Departmental Requirements

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Spe 160, 301, 375 9 hours

Area Sequences

1. Theatre Arts and Drama Major:
   (a) 9 hours from Spe 230, 251, 260, 261, 364, 450; 4 hours from Spe 262, 264, 463; 6 hours from Spe 361, 363, 461, 462, 464; 9 hours from Spe 465, 466, 467, 468.
   (b) 6 hours from Hum 201, Engl 303, 304, 308, 334, 409, 410, 432, C T 410, 411, Arch 115, 116.

2. Rhetoric and Public Address Major:
   (a) Spe 101 or 112, 231, 234, 235, 301, 331, 401, 481; 6 hours from Spe 423, 424, 425; 3 hours from Spe 250, 251, 260, 261.
   (b) 6 hours from recommended courses from history, philosophy, political science, psychology, or sociology.

3. Speech Pathology and Audiology Major:
   (a) Spe 205, 325, 370, 472, 475 (6 hours); CFS 240 or Educ 201; 9 hours from Spe 364, 435, 471, 474, 477, 480, 481, 499.

4. Speech Education Major: see listings under the Department of Education.

Forensic Program

The Washington State University Forensic Program provides a wide range of experiences for students interested in participating in intercollegiate debate and in other forensic activities. Students can take part by representing the university in several of the twenty tournaments attended by the WSU squad each year. Also available are opportunities to participate in tours of the state and in campus programs. Students help in the administration of three on-campus tournaments sponsored by the forensic program. Participants in intercollegiate debate can become eligible for membership in the national honorary forensic fraternity, Delta Sigma Rho-Tau Kappa Alpha. Any student, regardless of major field of interest and prior experience, is eligible to participate in the forensic program. For further information, contact the Director of Forensics, Department of Speech.

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, Master of Science in Veterinary Science, and Doctor of Philosophy (Veterinary Science). Additional information including admission is contained in the general information section of this catalog.

The following program is one example of the requirements necessary for application to professional study in the College of Veterinary Medicine at Washington State.

Preveterinary Requirements

To be selected from the list of General University Requirements: 

<table>
<thead>
<tr>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>English composition</td>
</tr>
<tr>
<td>21-31</td>
<td>Physical and biological sciences</td>
</tr>
<tr>
<td></td>
<td>Preferential consideration will be given to applicants who have completed courses as indicated in each of the following:</td>
</tr>
<tr>
<td></td>
<td>Zoology: including principles of cytology, evolution, ecology, and genetics</td>
</tr>
<tr>
<td></td>
<td>Chemistry: Including organic (with laboratory)</td>
</tr>
<tr>
<td></td>
<td>Physics: Including electricity, optics, and sound</td>
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<tr>
<td></td>
<td>Mathematics: College-level algebra and trigonometry or equivalent</td>
</tr>
<tr>
<td>14-24</td>
<td>Electives</td>
</tr>
</tbody>
</table>

259
Recommended: Advanced writing, business administration, public speaking, animal breeding and production, general or agricultural economics, and additional courses in the physical and biological sciences.

Physical Education—four semesters

Total 60

The College of Veterinary Medicine at Washington State University is accredited by the American Veterinary Medical Association.

Department of Veterinary Medicine and Surgery

Professor and Chairman of the Department, R. L. Ott; Professor, P. K. Bracken, G. H. Keown; Associate Professors, J. E. Alexander, O. L. F. Prof, L. M. Koger, D. R. Lingard, G. D. P. Pettit, J. D. Robinette; Assistant Professors, P. B. Anderson, G. M. Bryan, G. E. Burrows, M. Inverso; Residents, P. J. McKeever, R. E. Sande.

Description of Courses

V MS For explanation see Index under "Symbols"

208 Anatomy and Physiology 4 (3-3) II Prereq Chem 102; Bio S 104. Majors in the College of Agriculture.

301 Veterinary Anatomy 5 (0-15) I Prereq admission to Vet Med.

305 Microscopic Anatomy 4 (2-6) I Prereq admission to Vet Med.

402 Veterinary Anatomy 5 (0-15) II Prereq V An 301.

406 Microscopic Anatomy 4 (2-6) II Prereq V An 305.

411 Applied Anatomy 2 (1-3) I Prereq V An 402.

413 Advanced Anatomy 3 (1-6) May be repeated for 6 hours credit. II Prereq V An 402, 406. Microscopic and gross anatomy of selected organ systems.

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

592 Seminar 1 May be repeated for credit.

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

600 Research, Thesis, or Examination Variable credit.


462 Large Animal Medicine 4 I Prereq V MS 461. Continuation of V MS 461.

463 Small Animal Medicine 3 II Prereq c// in V MS 461.

464 Small Animal Medicine 3 I Prereq V MS 463.

465 Large Animal Medicine 5 II Prereq V MS 462. Diagnosis, treatment, and prophylaxis of large animal infectious diseases.

468 Small Animal Medicine 2 II Prereq V MS 464. Diagnosis, treatment, and prophylaxis of small animal infectious diseases.


472 Large Animal Surgery 4 (3-3) I Prereq V MS 471. Techniques.

473 Small Animal Surgery 4 (3-3) I Prereq V MS 471. Techniques.

477 Veterinary Obstetrics and Genital Diseases 4 (3-3) II Prereq V An 402; V Pa 446. Diagnosis, symptomatology, and treatment of reproductive disorders.

481 Radiology 3 I Prereq V Pa 446. Techniques of taking and processing radiographs (radiography) and interpretation of radiographs (diagnostic radiology).
Advanced Radiology 3 (1-6) II Prereq V MS 481. Veterinary radiology and radiation therapy.

Clinics 6 (0-18) I Prereq V MS 379. Clinical practice.

Clinics 6 (0-18) II Prereq V MS 487. Continuation of V MS 487.

Advanced Clinical Veterinary Medicine 1-3 May be repeated for credit. II Prereq V MS 462, 464. Special topics.

Metabolic Diseases 3 II

Advanced Clinical Medicine 3 (1-6) May be repeated for 6 hours credit. Techniques including clinical instrumentation, clinical chemistry; laboratory diagnosis including virus disease diagnostic procedures.

Advanced Surgery 3 (1-6) May be repeated for credit. II Prereq V MS 473. Clinical and experimental techniques.

Special Problems 1-4 May be repeated for credit.

Seminar in Clinical Medicine 1 May be repeated for credit.

Seminar 1 May be repeated for credit.

Special Problems 1-4 May be repeated for credit.

Research, Thesis, or Examination Variable credit.

Department of Veterinary Microbiology

Professor and Chairman of the Department,
S. G. Kenzy; Professors, T. Moll, L. M. Ringer; Associate Professor, R. W. G. Gillespie; Assistant Professors, D. Burger, B. R. Cho.

Description of Courses

V Mic For explanation see Index under "Symbols"

331 Veterinary Microbiology 3 (2-3) II Prereq V An 501, 305; V Ph 317. Veterinary bacteriology, mycology, and immunology.

336 Biological Concepts of Disease Control in Poultry and Wildbirds 2 I 1971-72 a/y. Prereq A S 204; Bact 201.

341 Veterinary Microbiology 3 (1-6) I Prereq V Mic 331. Bacteria that produce disease in animals.

342 Veterinary Virology 3 (2-3) II Prereq V Mic 431. Viruses pathogenic for animals.

343 Veterinary Epidemiology and Public Health 3 (2-3) II Prereq V Mic 431; V Pa 446. Veterinary aspects of public health including biometry and environmental sanitation.

434 Advanced Reading in Veterinary Microbiology 1 (0-3) May be repeated for credit. Prereq 4th year in Vet Med. Auxiliary reading program under tutorial guidance over a broad range of topics in veterinary microbiology.

435 Avian Diseases 3 (2-3) II Prereq V Mic 431; V Pa 445. Diseases affecting birds.

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

531 Advanced Veterinary Microbiology 4 (2-6) May be repeated for credit. II S 1971 a/y. Prereq Bact 411 or V Mic 431. Advanced topics.


533 Advanced Veterinary Diagnostic Microbiology 3 (0-9) May be repeated for credit. Prereq Bact 411 or V Mic 431. Isolation and identification of bacterial, mycotic, and viral agents in diseased organs and tissues of animals.


592 Seminar 1 May be repeated for credit.

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

600 Research, Thesis, or Examination Variable credit.

Department of Veterinary Pathology

Professor and Chairman of the Department,
J. B. Henson; Professors, J. S. Dunlap, R. C. Piper, G. R. Spencer; Associate Professor, D. M. Flaherty; Assistant Professors, T. C. Crawford, E. O. Dickinson, G. A. Hegreberg, S. D. Lincoln, T. C. McGuire, G. A. Padgett, G. L. Van Hoosier, Jr.; Lecturer, J. R. Gorham. Adjunct Professors, W. C. Dolowy, W. J. Hadlow; Adjunct Associate Professor, W. J. Clarke.

Description of Courses

V Pa For explanation see Index under "Symbols"

445 General Pathology 5 (3-6) I Prereq V An 406; V Ph 418. Structural and
functional alterations in disease; elementary oncology.

446 Special Pathology 5 (3-6) II Prereq V Pa 445. Systemic and communicable
diseases; toxicoses.

448 Meat Hygiene 2 II Prereq V Pa 446. Meat and meat products.

450 Dairy and Meat Inspection 1 (0-3) S Prereq V Pa 448.

451 Veterinary Parasitology 3 (2-3) I Prereq V An 406. Protozoa and arthropods
of veterinary importance; life cycle, disease, control, and treatment.

452 Veterinary Parasitology 4 (3-3) II Prereq V Pa 445. Helminths of veterinary
importance; life cycles, disease, control, and treatment.

454 Diseases of Laboratory Animals 3
(2-3) II 1971-72 a/y. Prereq V Pa 446. Diseases of the smaller laboratory
animals.

455 Clinical Pathology 3 (2-3) I Prereq V Pa 446. Laboratory diagnostic tech-
niques and their interpretation.

456 Clinico-Pathological Conference 1 (0-3)
I Prereq V MS 579. Current cases.

457 Clinico-Pathological Conference 1 (0-3)
II Prereq V Pa 456. Current cases.

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

541 Epizootiology 3 (2-3) II 1971-72 a/y. Prereq Bact 412 or V Pa 446. Natural
history of disease.

542 Advanced Diagnostic Pathology 3 (2-3)
or 4 (2-6) May be repeated for 8 hours credit. Studies in microscopy, histopa-
thology, and surgical pathology.

544 Immunopathology 2 (1-3) I 1970-71 a/y. Prereq V Mic 451 or V Pa 446. Delineation
of the role of immune process in the genesis of disease and disease states which result.

548 Seminar in Experimental Pathology 1
May be repeated for credit. I

549 Advanced Systemic Pathology I 4 (2-6)
II 1970-71 a/y. Prereq V Pa 446. Pathology found in selected organ sys-
tems and oncology.

550 Advanced Systemic Pathology II 4
(2-6) I 1971-72 a/y. Prereq V Pa 446. Selected organ systems.

592 Seminar 1 May be repeated for credit.

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

600 Research, Thesis, or Examination Vari-
able credit.
<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>1st Year</td>
<td></td>
</tr>
<tr>
<td>402</td>
<td>Anatomy</td>
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<tr>
<td>406</td>
<td>Microscopic</td>
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<td>418</td>
<td>Physiol and Biochem</td>
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<tr>
<td>331</td>
<td>Microbiology</td>
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<td>2nd Year</td>
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<tr>
<td>445</td>
<td>General</td>
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<tr>
<td>431</td>
<td>Microbiology</td>
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<tr>
<td>451</td>
<td>Parasytology</td>
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<tr>
<td>416</td>
<td>Endocrinology</td>
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<tr>
<td>479</td>
<td>Animal Nutr</td>
</tr>
<tr>
<td>3rd Year</td>
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<tr>
<td>446</td>
<td>Special Path</td>
</tr>
<tr>
<td>452</td>
<td>Virology</td>
</tr>
<tr>
<td>452</td>
<td>Parasytology</td>
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<tr>
<td>471</td>
<td>General Surgery</td>
</tr>
<tr>
<td>435</td>
<td>Avian Diseases</td>
</tr>
</tbody>
</table>

### 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 be restricted to 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 or one semester of physics and one semester of college algebra; one semester of comparative vertebrate anatomy and one semester of physiology.

### 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. For the third group there may be from one to several pertinent fundamental courses.

There are ample facilities for graduate study in environmental biology, development, systemsatics, physiology, and wildlife biology.

Special facilities include the Vertebrate Collections of the Charles R. Conner Museum, G. E. Hudson, Curator. An Electron Microscope Laboratory and the Computing Center are readily accessible.

This department offers courses of study leading to the degrees of Bachelor of Science in Wildlife Biology, Bachelor of Science in Zoology, Master of Science in Wildlife Biology, Master of Science in Zoology and Doctor of Philosophy (Zoology, Zoophysiology).
Description of Courses

For explanation see Index under "Symbols"

General Zoology

Zool


222 Vertebrate Biology 3 (2-3) II Prereq Bio S 104. Systematics, natural history, and evolution of invertebrates.

225 Museum Preparation 2 (0-6) or 3 (0-9) I Preservation and preparation of vertebrate specimens, mainly birds and mammals, including skeletons, study skins, and mounts.

251 [B] Introductory Human Physiology 4 (3-3) Prereq 1 sem Chem or Ph S 101. Mechanics of basic functions; basic functions in the frog and their relation to the human.

301 Genetics 3 Same as Genet 301.

302 Genetics Lab 1 (0-3) Same as Genet 302.

320 Vertebrate Morphogenesis 5 (3-6) I Prereq Zool 220. Vertebrate morphology interpreted as a consequence of developmental and evolutionary processes; form and function.

330 (230) [B] Principles of Conservation 3 Prereq Bio S 101, 102, 103, or Bact 101. Conservation of major natural resources through a biological approach, including philosophical, economic, and political aspects of important conservation issues.

352 Principles of Zoophysiology 4 (3-3) I Prereq Org Chem; Bio S 104. (Bio S 104 may be waived in cases of students presenting 16 hrs Ph S including Org Chem and Bio S 103.)

353 Principles of Zoophysiology 4 (3-3) II Prereq Org Chem; Bio S 104. (May be waived, as above.) Continuation of Zool 352.


417 Parasitology 4 (2-6) II Prereq Bio S 104. Types of associations, life cycles, control, prevention, and modifications of parasites; examination of parasitic protozoa and helminths.

420 Microanatomy 5 (3-6) I Prereq Zool 320, junior standing. Microscopic analysis of selected cell types, tissue, and organ structure; organization and function.


470 Experimental Embryology 3 (1-6) II Prereq Zool 320. Experiments used in analyzing causal relationships in basic developmental processes.

473 Principles of Animal Development 2 II Prereq Zool 320. A broad spectrum approach to development; classical and modern experiments in a variety of developing systems; vertebrates and invertebrates.

474 Laboratory in Animal Development 2 (0-6) II Prereq Zool 473 or c/. Major developmental concepts illustrated primarily by experiments on developing sea urchins and amphibians.


512 Limnology 3 (2-3) I 1971-72 a/y. Prereq Math 171; Zool 222. Chemical, physical, and biological characteristics of inland waters.


553 (453) Comparative Physiology 4 (3-3) I 1971-72 a/y. Prereq Zool 222, 352 or 353; 8 additional hrs Bio S or Ph S. Mechanisms of basic functions in the important animal phyla.

Department of Zoology


60 Environmental Physiology 3 (2-3) I 1970-71 a/y. Prereq Zool 353, 553, or 557. Physiological modes of adaptation of vertebrates to their temporal and physical environments.

62 Neurophysiology 3 II 1971-72 a/y. Prereq Zool 352 or 553. Structure and function of nervous tissues; organization of nervous systems; variations in nervous systems relating to plasticity of behavior.

90 Advanced Topics in Zoology 2 May be repeated for 6 hours credit. Recent advances in zoology.

Wildlife Biology

Zool

32 Wildlife Techniques 2 (1-3) II 1971-72 a/y. Prereq Bio S 103. Students are required to conduct a field project applying recent investigational techniques.


13 Advanced Fishery Management 3 II 1971-72 a/y. Compensation as a phenomenon basic to exploitation; yield in numbers and weight; models of yield; stock-recruitment functions; economic yield. Field trip required. Cooperative course taught at the University of Idaho.

14 Fishery Ecology 2 (1-3) or 3 (2-3) Racial discrimination, migration, and spawning activities of salmonids; environmental stress with reference to physiology, competition, predation, and pollution. Field trip required. Cooperative course taught at the University of Idaho.

Problems, Seminar, and Research and Thesis

Zool

393 Seminar 1 Prereq 16 hrs biology. Training in abstracting and reporting recent and classical research in zoology.

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

593 Seminar 1 May be repeated for credit. Prereq 20 hrs Zool. Literature and problems.

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

600 Research, Thesis, or Examination Variable credit.

Schedule of Studies

At least 20 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

A candidate for the bachelor's degree should fulfill the graduation requirements of the College of Sciences and Arts and the general departmental requirements for graduation.

General Departmental Requirements

<table>
<thead>
<tr>
<th>Additional Engl Comp</th>
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<tbody>
<tr>
<td>Chemistry (including one course in organic)</td>
<td>16</td>
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<tr>
<td>Physics</td>
<td>8</td>
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<tr>
<td>Calculus</td>
<td>4</td>
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<tr>
<td>Bio S 103 and 104</td>
<td>8</td>
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<tr>
<td>Zool 220 Vertebrate Biology</td>
<td>3</td>
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<tr>
<td>Zool 222 Invertebrate Biology</td>
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<tr>
<td>Zool 393 Seminar</td>
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<tr>
<td>Additional Biological Science</td>
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</table>

At least 12 of the 16 hours must be in zoology including one course from each of the following groups: Zool 301, 320; Zool 330, 410, 435, 438; Zool 352, 353.

Wildlife Biology Option

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Bio S 103 Introductory</td>
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<tr>
<td>Chem 105 Principles</td>
<td>4</td>
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<tr>
<td>Engl 101 Composition</td>
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</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
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<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
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<table>
<thead>
<tr>
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<th>Hours</th>
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<tr>
<td>Bio S 104 Introductory</td>
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</tr>
<tr>
<td>Chem 106 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Engl 108 Intro to Lit</td>
<td>3</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
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<tr>
<td>ROTC or Elective</td>
<td>2-3</td>
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<tr>
<td>P E</td>
<td>1/2</td>
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</table>
## Sophomore Year

<table>
<thead>
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<th>Semester</th>
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<th>Hours</th>
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<tr>
<td>First</td>
<td>Zool 220</td>
<td>Vert Biology</td>
<td>3</td>
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<tr>
<td></td>
<td>Zool 330</td>
<td>Prin of Conservation</td>
<td>3</td>
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<tr>
<td></td>
<td>Phys 101 or 201</td>
<td></td>
<td>4</td>
</tr>
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<td></td>
<td>Elective</td>
<td></td>
<td>3-5</td>
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<td></td>
<td>OTG or Elective</td>
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<td>2-3</td>
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<thead>
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<th>Course Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>Second</td>
<td>Ingl 201</td>
<td>Inter Comp</td>
<td>3</td>
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<tr>
<td></td>
<td>Zool 222</td>
<td>Invert Biology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Zool 423</td>
<td>Ornithology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Phys 102 or 202</td>
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<td>4</td>
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<tr>
<td></td>
<td>OTG or Elective</td>
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<td>2-3</td>
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<td>1/2</td>
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## Junior Year

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<th>Course Title</th>
<th>Hours</th>
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<tr>
<td>First</td>
<td>Chem 240 or 241</td>
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<td>4-5</td>
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<tr>
<td></td>
<td>Zstat 301 or Zool 320</td>
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<td>3-5</td>
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<td></td>
<td>L or Elective</td>
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<td>3-4</td>
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<tr>
<td></td>
<td>Zool 380 or 435</td>
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<td>3</td>
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<td></td>
<td>Gum or Soc S Elective</td>
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<td>2-3</td>
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<tr>
<td>Second</td>
<td>Bot 232</td>
<td>Systematic</td>
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<tr>
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<td>Zool 232 or 436</td>
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<td></td>
<td>L or Elective</td>
<td></td>
<td>3-4</td>
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<tr>
<td></td>
<td>Zool 410</td>
<td>Invert Zool</td>
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<tr>
<td></td>
<td>Gum or Soc S Elective</td>
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<td>2-3</td>
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## Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First</td>
<td>Zool 428</td>
<td>Mammalogy</td>
<td>3</td>
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<tr>
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<td>Zool 435 or 531</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Bot 462</td>
<td>Synecology</td>
<td>3</td>
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<tr>
<td></td>
<td>Zoophys Elective</td>
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<td>4</td>
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<tr>
<td></td>
<td>Gum or Soc S Elective</td>
<td></td>
<td>3</td>
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<tr>
<td>Second</td>
<td>Zool 232 or 436</td>
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<td>2-3</td>
</tr>
<tr>
<td></td>
<td>Chem Elective</td>
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<tr>
<td></td>
<td>Bot 463</td>
<td>Field Ecology</td>
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<tr>
<td></td>
<td>Gum or Soc S Elective</td>
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<tr>
<td></td>
<td>Elective</td>
<td></td>
<td>3-4</td>
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</table>

Courses printed in Roman type are required or graduation, in italics are optional.

## Preparation for Graduate Study

Students with undergraduate majors in such fields as zoology, biology, physiology, chemistry, physics, forestry and range management, botany, and the various areas of animal sciences in the College of Agriculture may be well prepared for graduate study in the department.
Faculty

On file in the Office of the President, December 1, 1969

Alpo I. Aapola  (PhD, Cornell University) Research Associate in Plant Pathology (Prosser).

Harold T. Abbott  (MLA, Harvard University) Professor of Horticulture.

Robert E. Ackerman  (PhD, University of Pennsylvania) Associate Professor of Anthropology.

William B. Ackley  (PhD, Washington State University) Chairman, Professor, and Horticulturist, Department of Horticulture, and Extension Specialist E-4 in Horticulture.

Betty K. Adams  (MD, University of Washington) University Physician, Student Health Service.

Donald F. Adams  (MS, Washington State University) Chemist, College of Engineering Research Division.

John F. Adams  (PhD, University of Washington) Associate Professor of English.

Mark F. Adams  (PhD, Washington State University) Chemist, College of Engineering Research Division.

Samuel H. Adams  (EdD, Washington State University) Assistant Professor of Physical Education for Men.

Ronald J. Adkins  (PhD, University of Washington) Assistant Professor of Zoophysiology.

I. Richard Adlard  (BS, Oregon State University) County Extension Agent E-2, Skamania County.

Marlene J. Adrian  (DPE, Springfield College) Assistant Professor of Physical Education for Women.

Allen F. Agnew  (PhD, Stanford University) Director, Water Research Center, and Professor of Geology.

Murit D. Aichele  (BS, Washington State University) Collaborator in Plant Pathology, SDA (Prosser).

Tosho Akamine  (EdD, Washington State University) Associate Professor of Education.

Roger D. Akre  (PhD, Kansas State University) Associate Professor of Entomology and Associate Entomologist.

Diane R. Albright  (MA, University of Michigan) Instructor in Physical Education for Women.

Carol L. Aldinger  (BS, Washington State University) Junior Chemist, College of Engineering Research Division.

Floyce M. Alexander  (BA, University of Washington) Editorial Assistant, Office of Publication.

John E. Alexander  (MS, Washington State University; DVM, Ontario Veterinary College at Guelph, Ontario, Canada) Associate Professor of Veterinary Clinical Medicine and Surgery.

Robert E. Allan  (PhD, Kansas State University) Associate Professor of Agronomy, Collaborator, USDA.

Florence D. Allen  (BS, University of Missouri) County Extension Agent E-3, Pierce County.

John P. Allen  (MLib, University of Washington) Librarian 4.

Lestella J. Allen  (MA, Colorado State University) County Extension Agent E-2, Pacific County.

J. Lewis Allison  (PhD, University of Minnesota) Superintendent, Irrigated Agriculture Research and Extension Center, and Plant Pathologist (Prosser).

David F. Allmendinger  (PhD, Washington State University) Superintendent, Western Washington Research and Extension Center, Vice-Director, College of Agriculture Research Center, and Horticulturist (Puyallup).

Loren B. Almy  (MS, University of Minnesota; Reg. Prof. Engr.) Professor of Civil Engineering.

Bruce Anawalt  (PhD, Wayne State University) Associate Professor of English.

Donald Anawalt  (MFA, Washington State University) Assistant Professor of Fine Arts.

Loretta Anawalt  (MA, Wayne State University) Publications Editor E-2, Cooperative Extension Service.

Dale G. Andersen  (EdD, Arizona State University) Associate Professor of Education.

Betty M. Anderson  (BS, University of Washington) Assistant Professor of Nursing (Spokane).
Carol K. Anderson (BS, Linfield College) County Extension Agent E-1, Chelan County.

Dorman D. Anderson (MS, Illinois Institute of Technology) Assistant Professor of Architecture.

Frank A. Anderson (BEd, Washington State University) County Extension Agent E-2, Benton County.

Jay V. Anderson (MS, University of Idaho) Assistant Electrical Engineer, College of Engineering Research Division.

Kenneth L. Anderson (MA, University of Texas) Assistant Professor of History.

Palmer B. Anderson (DVM, Michigan State University) Assistant Professor of Veterinary Clinical Medicine and Surgery.


Wilbur C. Anderson (BS, Oregon State University) Assistant Horticulturist (Mt. Vernon).

Daniel K. Andrews (PhD, University of Wisconsin) Extension Poultry Specialist E-3 (Puyallup).

Elden L. Andrews (BS, Washington State University) County Extension Agent E-1, Thurston County.


Edward W. Anthon (MS, Utah State University) Entomologist (Wenatchee).

John F. Armstrong (BS, University of Nevada) Collaborator, USPHS (Wenatchee).

Ross O. Armstrong (PhD, University of Iowa) Assistant to Executive Vice President, Director of Institutional Studies, and Associate Professor of Education.

Jessie M. Arney (BS, University of Washington) County Extension Agent E-2, King County.

Herbert E. Arnson (MA, University of Puget Sound) Professor of English.

Herbert L. Ashlock Assistant Technical Editor, Technical Extension Services.

U. S. Ashworth (PhD, University of Missouri) Professor of Dairy Science and Dairy Scientist.

George T. Austin (PhD, Purdue University)  Reg. Prof. (Engr.) Chairman and Professor, Department of Chemical Engineering, and Chemical Engineer, College of Engineering Research Division.

Helen F. Austin (MS, Purdue University) Assistant Chemist, College of Engineering Research Division.

James L. Avant, Jr. (MS, Indiana University) Assistant Professor of Physical Education for Men.

Warren E. Babcock (MLS, Brigham Young University) Librarian 1.

Thomas A. Baenen (BA, St. Johns University) Lecturer in Business Administration.

Wilmer W. Baer (MS, University of Denver; CPA) Associate Professor of Business Administration.

Howard M. Bahr (PhD, University of Texas) Associate Professor of Sociology and Associate Rural Sociologist.

William A. Bakamis (EdD, Bradley University) Professor of Industrial Arts.

Aaron S. Baker (PhD, Michigan State University) Associate Soil Scientist (Puyallup).

Richard A. Baker (PhD, University of California) Associate Professor of Electrical Engineering.

Mohammad S. Balegh (PhD, Washington State University) Research Associate in Biophysics Program.

James K. Ballard (BS, Colorado State University) County Extension Agent E-2, Yakima County.

James E. Balyeat (MA, University of California at Davis) Assistant Professor of Fine Arts.

W. Lee Barnesberger (BS, South Dakota School of Mines and Technology) Junior Chemist, College of Engineering Research Division.

William Band (DSc, University of Liverpool) Professor of Physics.

Haakon Bang (PhD, Purdue University) Professor of Pharmacy Administration.

Edward Bannister (MA, University of California at Los Angeles) Assistant Professor of Communications.

Kenneth E. Barber (PhD, Purdue University) Extension Family Life Specialist E-2, Cooperative Extension Service, and Assistant Rural Sociologist, Department of Rural Sociology.

Glenise S. Barber (BS, Chelsea College) Instructor in Physical Education for Women.
Françoise Beamish  (MA, Purdue University) Instructor in Foreign Languages.

Robert L. Beamish  (PhD, University of Washington) Assistant Professor of Foreign Languages.

Robert L. Beardemphl  (MEd, University of Idaho) Instructor in Education.

Gordon E. Bearse  (BS, University of Massachusetts) Poultry Scientist (Puyallup).

Wallis Beasley  (PhD, George Peabody College) Executive Vice President and Professor of Sociology.

Walter A. Becker  (PhD, University of California) Professor of Genetics and Poultry Scientist, Department of Animal Sciences.

Paul L. Beckett  (PhD, University of California at Los Angeles) Professor of Political Science.

Thomas M. Beetle  (MS, Cornell University) Lecturer in Mathematics (Richland) Courtesy Appointment.

Judith E. Bell  (MEd, Central Washington State College) Assistant Professor of Education.

Paul M. Bellamy  (BA, Washington State University) Assistant Physicist, Department of Physics.

Bernice M. Belshaw  (MS, Cornell University) County Extension Agent E-3, King County.

Donald L. Bender  (PhD, University of Wisconsin; Reg. Prof. Engr.) Associate Professor of Civil Engineering.

Paul A. Bender  (PhD, University of Colorado) Assistant Professor of Physics.

Carl A. Bennett  (PhD, University of Michigan) Adjunct Professor of Mathematics (Richland).

Edward M. Bennett  (PhD, University of Illinois) Associate Professor of History.

Paul J. Bennett  (BS, Whitworth College) Junior Chemist, College of Engineering Research Division.

David P. Benseler  (MA, University of Oregon) Assistant Professor of Foreign Languages.

Nels Benson  (PhD, Washington State University) Soil Scientist and Horticulturist (Wenatchee).

Robert L. Benson  (PhD, University of Illinois) Assistant Professor of Entomology and Assistant Entomologist.

Lawrence R. Berg  (PhD, Washington State University) Poultry Scientist (Puyallup).
Arnold G. Berlage  (MS, Michigan State University) Collaborator in Agricultural Engineering, USDA (Wenatchee).

John W. Bernard  (BS, University of Idaho) County Extension Agent E-2, King County.

H. Russell Bernard  (PhD, University of Illinois) Assistant Professor of Anthropology.

Herbert W. Berndt  (MS, Colorado State University) Collaborator in Forestry, USFS (Wenatchee).

Robert E. Berney  (PhD, University of Wisconsin) Associate Professor of Economics.

Bradford W. Berry  (MS, New Mexico State University) Instructor in Animal Sciences and Junior Animal Scientist.

James W. Berry, Jr.  (PhD, Michigan State University) Assistant Horticulturist and Extension Horticulture Specialist E-2 (Prosser).

Stanley Berry  (MEd, Washington State University) Director of Admissions.

Alan A. Berryman  (PhD, University of California) Associate Professor of Forestry and Range Management and Associate Entomologist.

B. Rodney Bertramson  (PhD, Oregon State University) Director of Resident Instruction, College of Agriculture, and Agronomist.

George A. Bettas  (MEd, Texas Christian University) Head Resident, Rogers Hall.

Attie L. Betts  (PhD, University of Texas; Reg. Prof. Engr.) Chairman and Professor, Department of Electrical Engineering.

Surinder K. Bhagat  (PhD, University of Texas) Assistant Professor of Civil Engineering and Assistant Sanitary Engineer, College of Engineering Research Division.

Vishnu N. Bhatia  (PhD, University of Iowa) Coordinator of Honors Program and Professor of Pharmacy.

Orlin Biddulph  (PhD, University of Chicago) Acting Chairman and Professor of Biophysics Program and Professor of Botany.

Darrel R. Bienz  (PhD, Cornell University) Associate Professor of Horticulture and Associate Horticulturist.

June M. Bierbower  (BA, University of Nebraska) Manager, Public Services and Publicity, and Editor, University Relations.

Harriet M. Bierman  (BA, Central Washington State College) County Extension Agent E-2, Pend Oreille County.

Nelson L. Bills  (MS, West Virginia University) Collaborator in Agricultural Economics, USDA.

Donald H. Bishop  (PhD, University of Edinburgh) Associate Professor of Philosophy.

Warren A. Bishop  (BA, Colorado State College) Vice President—University Development.

Charles E. Blackburn  (PhD, Yale University) Associate Professor of English and Coordinator of the Accreditation Study.

Constance B. Blaine  (MEd, Colorado State University) Extension Agent E-2 (Pullman).

James L. Blaine  (DVM, Washington State University) Collaborator in Veterinary Pathology (Spokane).

Leroy L. Blakeslee  (PhD, Iowa State University) Assistant Professor of Agricultural Economics and Assistant Agricultural Economist.

Dewitt Blamer  (MA, Washington State University) Head Resident, Goldsworthy Hall.

Sylvia A. Bliven  (BA, Washington State University) County Extension Agent E-2, Island County.

Earle C. Blodgett  (PhD, University of Wisconsin) Collaborator in Plant Pathology, SDA (Prosser).

Philip E. Bloom  (MEd, Colorado State University) County Extension Agent E-4, Kittitas County.

T. H. Blosser  (PhD, University of Wisconsin) Chairman, Department of Animal Sciences, Professor of Dairy Science, and Dairy Scientist and Extension Specialist E-4 in Dairy Science.


Bernard E. Bobb  (PhD, University of California at Los Angeles) Professor of History.

Jean A. Boddy  (BA, Eastern Washington State College) County Extension Agent E-1, Thurston County.

George J. Bogdanovitch  (MFA, Iowa State University) Assistant Professor of Fine Arts.
Thomas P. Bogyo (DSc, University of
Budapest) Associate Professor of
Genetics and Associate Statistician,
College of Agriculture Research.

William J. Bohanan (MA, George Pea-
body College) Assistant Professor of
Education.

Douglas M. Bolls (MS, San Diego State
College) Associate in Research, De-
partment of Veterinary Microbiology.

Cecil R. Bond (BS, Washington State
University) County Extension Agent
E-2, Asotin County.

Christopher H. Bone (PhD, University of
Chicago) Assistant Professor of
History.

George A. Bowman (MS, University of
Wisconsin) Editor, College of Agricul-
ture Research.

Losa Lee Boyd (BS, Louisiana Poly-
technic Institute) County Extension
Agent E-2, Asotin County.

Alfred M. Boyington (MM, University of
Michigan) Professor of Music.

Frank K. Bracken (DVM, Colorado
State University) Professor of Veteri-
inary Clinical Medicine and Surgery.

orman A. Braden (MA, University of
Kentucky) Director, General Extension
Service.

Joseph T. Bradley (JD, University of
Washington) Professor of hotel and
Restaurant Administration.

Robert F. Bradley (MF, Oregon State
University) County Extension Agent
E-2, Pierce County.

George B. Brain (EdD, Columbia Uni-
versity) Dean, College of Education,
and Professor of Education.

Frank W. Brands (MS, Washington State
University, Reg. Prof. Engr.) Associate
Professor of Electrical Engineering.

William E. Brandt (PhD, University of
Rochester) Professor of Music.

stanton E. Braun (PhD, University of
Arizona) Assistant Agronomist and Ex-
tension Agronomy Specialist E-2 (Puy-
allup).

Charles Brayton (MS, Washington
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Colleges and Departments

College of Agriculture (BS, ExM, MA, MS, and PhD degrees) Departments of Agricultural Economics, Agricultural Engineering, Agronomy, Animal Sciences, Entomology, Forestry and Range Management, Horticulture, and Plant Pathology. Programs in agricultural education, agricultural extension, agricultural mechanization, conservation, environmental science, food science, general agriculture, nutrition, and soils.

College of Economics and Business (BA, BAcct, MBA, MA, MAT, and PhD degrees) Departments of Business Administration, Economics, and Office Administration. Programs in geography and hotel and restaurant administration.


College of Engineering (BS, BArch, MS, and PhD degrees) Departments of Agricultural Engineering, Architecture, Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Metallurgy. Programs in building theory and practice, engineering science, environmental science, and nuclear technology.

College of Home Economics (BA, BS, MA, MS, MAT, and PhD degrees) Departments of Child and Family Studies; Clothing, Interior Design, and Textiles; and Foods, Nutrition, and Institution Management. Programs in child development, food science, home economics, home economics education, and nutrition.

College of Pharmacy (BPhar, MS, and PhD degrees)

College of Sciences and Arts (BA, BS, BMus, MFA, MA, MS, MAT, and PhD degrees) Departments of Anthropology, Bacteriology and Public Health, Botany, Chemistry, Communications, Computer Science, English, Foreign Languages, Geology, History, Mathematics, Philosophy, Physics, Police Science and Administration, Political Science, Psychology, Sociology, Speech, and Zoology; School of Music and Fine Arts, including Departments of Fine Arts and Music. Programs in American minority studies, American studies, Asian studies, biochemistry, biophysics, black studies, chemical physics, environmental science, general biology, general studies (biological science, humanities, physical science, and social science), genetics, literary studies, nursing, pre-dentistry, prelaw, premedicine, social studies, wildlife biology, and zoophysiology.

College of Veterinary Medicine (DVM, MS, and PhD degrees) Departments of Veterinary Anatomy, Veterinary Clinical Medicine and Surgery, Veterinary Microbiology, Veterinary Pathology, and Veterinary Physiology and Pharmacology. Pre-veterinary study.

Department of Aerospace Studies

Department of Military Science

Graduate School (EdM, ExM, MAT, MBA, MFA, MA, MS, EdD, and PhD degrees)

Short Sessions: The Summer Session.

State Services

General Extension Service
Adult Education, correspondence courses, correspondence courses, and extension classes.

College of Agriculture
Research Center and Cooperative Extension Service (Pullman); Coastal Washington Research and Extension Unit (Long Beach); Dry Land Research Unit (Lind); Irrigated Agriculture Research and Extension Center (Prosser); Northwestern Washington Research and Extension Unit (Mt. Vernon); Southwestern Washington Research Unit (Vancouver); Tree Fruit Research Center (Wenatchee); Western Washington Research and Extension Center (Puyallup).

College of Engineering
Research Division
Technical Extension Service

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