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1970-1971 Course Catalog

University of Montana--Missoula. Office of the Registrar

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Main Hall 209

housing
Director of Residence Halls
Elrod Hall
or
Manager of Family Housing
Elkhorn Court

summer session
Director of Summer Session
Field House 219

general information
Information Services
Main Hall 302

all addresses are followed by
University of Montana
Missoula, Montana 59801
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Mrs. Robert Haugen, Missoula
Theodore Jacobs, Missoula
Alex M. Stephanoff, Missoula

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William G. Craig, Ed.D. .................................................. Academic Vice President
Norman E. Taylor, Ph.D. .................................................. Vice President for Research
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John L. Delano, B.A. .................................................. Executive Director, Alumni Association
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Founding and Name . . . The University of Montana at Missoula was chartered February 17, 1893, by the Thirty-Fourth Legislative Assembly. Later legislation changed the name to the State University of Montana and Montana State University. On July 1, 1985, it again became the University of Montana.

Location . . . Missoula, a city of approximately 50,000 persons, is located at an elevation of 3,205 feet on the western slope of the Rocky Mountains at the confluence of five valleys: Flathead, Bitterroot, Clark Fork, Blackfoot and Frenchtown.

Accreditation . . . The University of Montana is fully accredited by the Northwest Association of Secondary and Higher Schools.

Each of the professional schools or departments with additional accrediting organization: the American Association of Collegiate Schools of Business, the American Chemical Society, the National Council for Accreditation of Teacher Education, the American Association of Engineering Societies, the American Council on Education for Journalism, the Association of American Law Schools and the American Council on Pharmaceutical Education.

Support and Endowment . . . Federal land grants made available during territorial days were allocated to the University on its creation. It continues, however, to receive its main support in the form of biennial legislative appropriations and student fees. It also receives gifts, grants and endowments for scholarships, teaching, development and research from private and other sources. The University of Montana Foundation, among others, is a tax-exempt trust, separately chartered and managed to receive, manage and distribute private contributions for University purposes.

Control and Administration . . . Subject to the Montana constitution and statutes, general control and supervision of all Montana state institutions of higher education are vested in the eleven-member State Board of Education, ex-officio Regents of the Montana University System. There is also a local three-member Executive Board for each institution. The administration of each institution is vested in a president.

By statute, the State's combined system of higher education is called the Montana University System. The office of the executive secretary is located in the State Capitol at Helena.

The right is reserved to change any of the rules and regulations of the University at any time including those relating to admission, instruction and graduation. The right to withdraw curricula and specific courses and to impose or increase fees similarly is reserved. All such changes are effective at such times as the proper authorities determine and apply not only to prospective students but also to those who already are enrolled in the University.

Functions and Goals . . . The University of Montana is responsible for providing: (1) undergraduate education in the arts and sciences, (2) professional and advanced professional education based on a sound foundation of arts and sciences, (3) graduate education, including doctoral programs, in selected fields, (4) research and other creative activities supported by both public and private sources and maintaining (5) a vigorous program of service as part of its responsibility to the state and the nation.

The University's program of undergraduate education makes available to the student a fund of knowledge pertaining to the world in which he lives and to the heritage of free men and institutions. It seeks to liberate his intellectual capacities for continued learning and to deepen his awareness of ethical and aesthetic values. It fosters these goals through (1) teaching that stimulates the student and inspires him to continue, on his own, the search for knowledge; (2) a campus environment that sustains the efforts of teachers and students to achieve the basic objectives for which the University exists; and (3) a curriculum that: (a) provides reasonable depth in the several liberal arts disciplines—the biological, physical and social sciences, the humanities and the fine arts, (b) requires demonstrated literacy in use of the English language and encourages competence in foreign languages, (c) provides opportunity for development of professional and technical competence in some field of endeavor, (d) reveals man's great insights and discoveries of the past and stimulates the individual to seek new insights and discoveries, (e) collections, enabling each student to develop his individual talents and capacities and (f) encourages a growing awareness of the significance of ethical values and the personal and social responsibilities of the educated person.

Property . . . The main University campus spans over 116 acres on the east side of Missoula. There are an additional 624 acres on Mt. Sentinel. A few blocks south of the main campus is a 154-acre site with 394 married student housing units and a nine-hole golf course. Approximately six miles southwest of the main campus is Missoula where the University owns a parcel of 295 acres. Two major UM facilities are located outside Missoula: 20,850 acres in Lubrecht Experimental Forest, 35 miles northeast of Missoula, and 167 acres on Flathead Lake including the Biological Station, 90 miles north of Missoula at Yellow Bay.

Libraries . . . Campus libraries have over 500,000 volumes in their collections, including extensive holdings of periodicals, maps, microtext, government publications and a special Northwest History collection. The library is a regional depository for United States Government documents and for the Army Map Service.

The University Biological Station is located at Yellow Bay on the east shore of Flathead Lake, 90 miles north of Missoula. The University controls 160 acres, including two islands, and has permission to carry on investigation on Wild Horse Island, an area of approximately 2,000 acres.

Facilities include an administration-recreation building, a four-room laboratory, three one-room laboratories, a kitchen and dining hall, three bath houses, thirty-five one-room and eleven two-room married student housing units, various maintenance buildings. These facilities and the new Morton J. Elrod Research Laboratory, dedicated in August 1967, enable a year-round program of research and teaching.

During the summer, field courses and research in botany and zoology are offered for upper division and graduate students. By virtue of the station's location, there is opportunity for research in many fields of biology.

For further information, write to the Director, Biological Station, University of Montana, Missoula, Montana 59801.

The Bureau of Business and Economic Research of the School of Business Administration is set up to provide Montana businessmen with the types of statistics useful to them in conducting their businesses; to disseminate information of general interest on the economic and social aspects of the state; and to engage in studies in the areas of economic and other social sciences which show promise of making contributions to knowledge, or to the development of methods of analysis, regardless of whether such studies are related directly to the state.

Publications include the Montana Business Quarterly and various monographs. Contributors include members of the bureau staff, the faculty, and on occasion, students.

The Forest and Conservation Experiment Station of the School of Forestry operates under Chapter 141, Laws of Montana of 1897. The dean of the School of Forestry was designated as director. The act specifies that the purposes of the station are:
"To study the growth and the utilization of timber . . . To determine the relationship between the forest water conservation and waterfall regulation; the forest and pasture for domestic livestock and wildlife; the forest and recreation and those other direct and indirect benefits that may be secured by the maintenance of or the establishment of forest or woodland stands . . . . To study the utilization of windbreaks, shelter belts and woodlots on the farms of the State . . . to study logging, lumbering and milling operations and other operations dealing with the products of forest soils with special reference to their improvement . . . ."

"To cooperate with the other departments of the Montana University System, the state forester and the state board of county commissioners, the state livestock commission and game commission, the state livestock commission . . . the United States government and its branches as a land grant institution, or otherwise, in accordance with their regulations."

"To collect, to compile and to publish statistics relative to Montana forests and forestry and the influence flowing therefrom: to prepare and publish bulletins and reports . . . to collect a library and bibliography of literature pertaining to or useful for the purpose of this act . . . to establish such field experiment stations . . . to accept for and in behalf of the State of Montana, such gifts of land or other donations as may be made."

The station is supported by funds appropriated by the congress and the State of Montana, income from the sale of forest products, grazing, mining and special leases, and by private grants. Research is concentrated on the 27,000-acre Lubrecht Experimental Forest and at appropriate locations throughout the state—much of it in cooperation with private, state and federal agencies.

Information derived from research conducted by the staff is made available to the people of Montana in printed bulletins, leaflets and circulars.

THE BUREAU OF GOVERNMENT RESEARCH, an adjunct of the Department of Political Science, furnishes an opportunity for independent faculty research, provides a training ground for undergraduate and graduate students and serves public officials and civic groups through organizing institutes and preparing publications. It is an information clearinghouse with collections of state legislative materials and publications of governmental agencies and similar bureaus. Publications include a bimonthly series entitled the Montana Public Affairs Report and an occasional series of pamphlets and monographs prepared by bureau staff, University faculty and other professionals in the field.

WILDLIFE RESEARCH UNIT . The Montana Cooperative Wildlife Research Unit was established at the University of Montana in 1949. The unit is staffed and supported cooperatively by the Montana Fish and Game Commission, the Department of Agriculture, the Wildlife Management Institute of Washington, D.C., and the University of Montana.

The purpose of the Cooperative Wildlife Research Unit is stated in the Memorandum of Understanding signed jointly by representatives of the above cooperating agencies as follows: . . . "to provide full active cooperation in the advancement, organization, and operation of wildlife education, research, extension and demonstration programs . . . ."

The Montana Unit, through its graduate research fellowship program, investigates wildlife problems approved by the Unit Coordinating Committee in order to make it possible for the commission to improve management of the wildlife resources for the people of the State of Montana. At the same time, this research work carried on under the supervision of the unit leader and University faculty contributes to the training of graduate students in the fields of wildlife management and wildlife biology.

Graduate work in Wildlife leads to a Master of Science in Wildlife Biology, which ordinarily requires two years of work beyond the bachelor's degree.

For application forms and information related to graduate work in wildlife, write to Graduate Studies in Wildlife Biology.

THE BUREAU OF PRESS AND BROADCASTING RESEARCH undertakes research and service projects as part of the program of the School of Journalism. It is responsible for The Montana Journalism Review and other publications of value to the press and broadcasting media.

EXTENSION, CONTINUING EDUCATION AND PUBLIC SERVICE. These agencies, working on or off campus with the faculty, administrative personnel of the University and community organizations, provide various services, including surveys, institutes, forums, short courses, conferences, training programs and community programs.

THE DIVISION OF EDUCATIONAL RESEARCH AND SERVICES provides special services in educational planning to school districts requesting assistance. The planning center provides new ideas to school districts, helps school boards interpret long-range plans to the community, coordinates the efforts of specialists and the community, develops bond issue programs and renders any other assistance to the local school districts relevant to their school planning needs. By participating in these community services, graduate students gain training and experience in educational research.

THE STELLA DUNCAN MEMORIAL INSTITUTE, housed in the Health Science Building, is supported by the National Institutes of Health of the Public Health Service and the Stella Duncan Memorial Fund for research in respiratory diseases. The institute has extensive research facilities—three fully equipped laboratories, hot room, cold room, two animal rooms and a well-equipped isolation room.

THE INSTITUTE FOR SOCIAL SCIENCE RESEARCH offers facilities and personnel for basic and applied research in all areas of human behavior, consultation and other professional services by qualified social scientists, availability to provide research and professional services anywhere and for any required duration, assistance in the preparation of all types of community surveys, evaluation or organizational programs and preparation of evaluation reports.

GENERAL REQUIREMENTS . . . Applicants for admission must be of good moral character. Veterans of any branch of the United States Armed Forces should present a discharge marked other than "dishonorable." Race, color and creed are not relevant to admission.

FRESHMEN REQUIREMENTS . . . RESIDENT: Graduates of any fully accredited high school who are legal residents of Montana are admitted to regular standing. The completion of a high school or preparatory course of four years is required for regular admission. The applicant must have completed at least three years of English and one year of American History and government to be eligible for consideration.

NONRESIDENT: Applicants must be in the upper 50 percent of their high school graduating class to be eligible for consideration for admission. If the high school does not rank its students, the results of the American College Test will be used to establish the equivalent level of competency.

ADMISSION BY EXAMINATION: A person not a graduate of an accredited high school may be admitted by passing the General Educational Development Tests and the supplemental tests in American History and government. Information regarding requirements and test centers available in Montana may be obtained from the Office of the State Superintendent of Public Instruction in Helena.

EARLY ADMISSION: A limited number of high school students who have completed their junior year may be granted early admission. For early admission an applicant must present a transcript of his high school record indicating superior achievement and a letter from the high school principal recommending early admission.
TRANSFER REQUIREMENTS...

RESIDENT: A legal resident of Montana who wishes to transfer to the University of Montana must meet the general requirements, be eligible to return to the school from which he is transferring, and have a record which would assure his admission to or reinstatement at the University of Montana had he been one of its students.

NONRESIDENT: A nonresident applicant wishing to transfer to the University of Montana must meet the general admission requirements, be eligible to return to the school from which he is transferring, and present transcripts verifying a 2.0 (C) average for all college and university work attempted to be eligible for consideration for admission.

SPECIAL STUDENTS... An applicant 21 years or older who does not meet the minimum requirements for regular admission as a freshman or an applicant who does not wish to work toward a degree may apply for consideration for admission as a special student. Examples of applicants generally considered for admission as special students are: (1) students who have earned a bachelor's degree and wish to take refresher courses or courses for their personal benefit, and (2) mature students who have been granted permission to enroll for selected courses without reference to the requirements of any prescribed course of study.

Special students may acquire status as regular students and become candidates for degrees either (a) by taking entrance examinations or (b) by transferring to entrance credit sufficient credits earned in the University to make up all entrance requirements for admission to regular standing. A special student may not register for his seventh quarter of residence, including summer quarters, until all entrance units required for admission to regular standing are completed.

APPLICATION FEE... A nonrefundable application fee of $10.00 (check or money order, NOT CASH) must be sent with the application for undergraduate or special admission. Applicants with a bachelor's degree are not required to pay this fee. No action will be taken on an application until this fee has been received in the Office of Admissions.

HOW TO APPLY FOR ADMISSION...

FRESHMEN APPLICANTS:
1. Montana residents may obtain the application for admission from their high school principal or guidance counselor. Nonresident applicants may obtain a copy of the application for admission by writing to the Director of Admissions, University of Montana, Missoula, Montana 59801.
2. The completed application, with the exception of the high school transcript and the Counseling Information and Personal Characteristics form, should be sent directly to the Director of Admissions. The transcript form and the Counseling Information and Personal Characteristics form should be given to your high school principal or guidance counselor for completion.
3. The $10.00 application fee should be attached to the application form sent by the student.

TRANSFER APPLICANTS:
1. A transfer applicant may obtain an application for admission by writing to the Director of Admissions, University of Montana, Missoula, Montana 59801.
2. The applicant should complete all of the application, with the exception of the high school transcript form and the Transfer Students Confidential Check Sheet. The completed application should be sent to the Director of Admissions.
3. The high school transcript form should be sent to the high school from which you graduated. This is required even though your high school graduation may be listed on your college transcript.
4. The Transfer Students Confidential Check Sheet should be sent to the Dean of Students at the last institution attended.
5. Request an official copy of your transcript from each college or university attended. Although an applicant's record from several institutions may be summarized on one transcript, an application will not be considered until an official transcript from each institution has been received. These are required even though no credit may have been earned.
6. The $10.00 application fee should be attached to the application form. Applicants who have earned a bachelor's degree are not required to submit this fee.

WHEN TO APPLY FOR ADMISSION...

FRESHMEN APPLICANTS: Freshmen applicants may apply for admission anytime after they have completed their junior year in high school. Resident applicants are not required to submit an official copy of their high school record until they have graduated. Nonresident applicants must submit an official copy of their high school record before a decision will be made regarding their admission.

TRANSFER APPLICANTS: Transfer applicants should apply for admission during the last term they plan to attend their present school, providing this date is within six months of the time they plan to enroll at the University of Montana.

APPLICATION DEADLINES: Complete credentials should be on file in the Office of Admissions by September 1 if the applicant wishes to be admitted for the Fall Quarter. Applications for the Winter Quarter or Spring Quarter should have their credentials on file at least one month prior to registration for the appropriate quarter.

NOTIFICATION OF ADMISSION DECISION...

Freshmen applicants will be notified of their admission or refusal approximately two weeks after the completed credentials have been received by the Office of Admissions. Transfer applicants will also be notified of their admission or refusal approximately two weeks after their completed credentials have been received in the Office of Admissions. If there is some question regarding the acceptability of some credit this decision may be delayed.

TRANSFER OF CREDIT...

In general, transfer of credits from other accredited collegiate institutions will be accepted insofar as they meet the degree, grade, and residence requirements of the student's chosen program of studies at this institution. Credit is given for the courses in which a grade of A, B, C, or D has been earned. An evaluation of credits which are being accepted by the University of Montana is sent to the applicant shortly after the notification of acceptance.

ADVANCED PLACEMENT...

Advanced placement with University credit may be allowed for college level high school courses, agreed upon in advance by the Office of Admissions and the University. Validation for credit will be determined by the University from scores earned by the student on University-constructed examinations or on the advanced placement tests of the College Entrance Examination Board.

TESTING...

All new freshmen, and transfer students with less than a full year in college, are required to take the AMERICAN COLLEGE TESTING PROGRAM examination preferably in October or December of the year before entrance into the university. The test also is offered in February, April and July. Complete information and registration forms are sent to all high school counselors and principals each year in advance of each test date. If information is not available, write to Director of Admissions, University of Montana, Missoula, Montana 59801.

Examination results are used for general advising purposes, to assist in identifying students with high college potential who may be seeking scholarships, for placement in English and as part of the information used to determine nonresident admissions.

New freshmen who do not take the AMERICAN COLLEGE TESTING PROGRAM examination in advance and have the results sent to the University will pay an $8 registration fee and take it on campus before they register.

Students from non-English speaking countries who wish to qualify for admission to the University must give evidence of proficiency in English. Students should arrange to take the Test of English as a Foreign Language (TOEFL). Requests for information on test procedures and applications should be directed to:
Test of English as a Foreign Language
Education Testing Service
Princeton, New Jersey 08540

When the student arranges to take the test, he may request the EDUCATIONAL TESTING SERVICE (ETS) to send the examination results to the Director of Admissions, University of Montana, Missoula, Montana 59801.

HEALTH EXAMINATION . . . Every applicant who is admitted to the University of Montana is required to submit a Health examination form before he is permitted to register. This form is sent to the applicant along with the letter of acceptance and should be completed by the applicant’s physician as soon as possible. The completed form should be mailed directly to the University Health Service.

registration . . .

Registrations are during Orientation Week, in advance of, and at the beginning of other quarters. A student’s registration is subject to the approval of an appointed faculty adviser until choice of major field of study has been made. After this choice, the head (or his delegate) of the department or school in which the curriculum is offered becomes the adviser. Students may not register after one week of classes. Registration is not complete until all fee charges are paid and registration cards are checked in to the Registrar’s Office.

ORIENTATION . . . Part of the first week of autumn quarter is set aside for orientation and registration. The program includes: (1) acquainting the student with the campus, the classroom buildings and residence halls; (2) explaining the University program—the types of instruction offered and the careers for which a student may prepare at the University; (3) placement tests; (4) social gatherings at which students become acquainted with fellow classmen, students of other classes and members of the faculty; and (5) official registration in the University, with the assistance of a member of the faculty in the selection of courses.

WAIVER OF PREREQUISITE . . . Instructors must file with the Registrar’s Office a “Waiver of Prerequisite” form for any student allowed in a course without meeting the stated prerequisite.

WITHDRAWAL OF A COURSE . . . The University reserves the right to withdraw any course for which fewer than five students are enrolled before the opening of the course.

CHANGES IN PROGRAM OF STUDIES . . . Courses may be added during the first week of a quarter. After the first week, courses may be added only with the consent of the adviser, the instructor and the student’s department chairman (or dean). To drop or add courses, change from credit to listener or vice versa, the student must secure a drop/add card from the Registrar’s Office and return it to that office after obtaining the required signatures. Withdrawal from a course is permitted during the first three weeks of instruction with a “W” (withdrawal, no credit). Withdrawal after three weeks with a “W” or a change from credit to listener status will be granted upon petition only in exceptional cases and upon the signed approval of the student’s adviser. An “F” will be assigned for a withdrawal after the third week unless a petition has been granted. All exceptional requests are reviewed by the faculty Graduation Committee. The committee’s decision is final. Advisers are required to meet with the Graduation Committee or supply the committee with a written statement in support of their advisee’s petition for exceptional consideration.

WITHDRAWALS FROM THE UNIVERSITY . . . Students who withdraw from the University during a quarter are required to fill out withdrawal forms in the Registrar’s Office. If this is not done, the student will not be entitled to certification of honorable dismissal, and “F” grades are assigned. When withdrawal forms signed by the dean or associate dean of students are filed before the end of the ninth week of a quarter, grades of “W” are assigned. Withdrawals of students on probation must be approved by the academic standards committee before grades of W will be assigned. After the ninth week, the student who withdraws receives a grade: an incomplete, an “F” or a completed grade with credit.

UNIVERSITY EMPLOYEES’ REGISTRATION . . . With approval of the school dean or department chairman and the academic vice president, regular-full-time employees of the University may register for programs of not more than 6 credits in a quarter.

degrees and majors . . .

Bachelor, master’s, doctor of education and doctor of philosophy degrees are offered at the University of Montana. The degrees of bachelor of arts and bachelor of science typically are awarded upon completion of a four-year academic course in the arts and sciences. These degrees require satisfaction of the foreign language requirement and completion of a major (a concentration in a single discipline or stated interdisciplinary program) of not more than 70 quarter credits. The bachelor of science degree is awarded in home economics and in health and physical education without a foreign language.

Professional degrees, with stated exceptions, provide for suitable emphasis on knowledge and skills appropriate to the profession concerned for suitable background in other areas of knowledge including those basic to the profession. The degrees Bachelor of Arts in Business Administration (not the B.S. in Business Administration), Bachelor of Arts in Journalism and Bachelor of Arts in Radio-Television require satisfaction of the foreign language requirement.

Details about degree requirements are found under the curricula listed alphabetically later in the catalog.

Graduate degrees offered at the University, including detailed degree requirements, are listed in the Graduate School bulletin which may be secured from the dean of the Graduate School.

COLLEGE OF ARTS AND SCIENCES

Bachelor of Arts, with majors in:

- Anthropology
- Astronomy
- Biology
- Botany
- Chemistry
- Classics
- Greek (No Major)
- Latin
- Economics
- Economics-Political Science
- Economics-Sociology
- English
- French
- Geography
- Geology
- German
- Health and Physical Education
- History
- History-Political Science
- Home Economics
- Italian
- Liberal Arts
- Mathematics
- Microbiology
- Philosophy
- Physics
- Political Science
- Political Science-Economics
- Political Science-History
- Pre-Medical Sciences
- Psychology
- Recreation
- Russian
- Social Welfare
- Sociology
- Sociology-Economics
- Spanish
- Speech Communication
- Speech Pathology and Audiology
- Zoology
- Bachelor of Science, with majors in Chemistry, Computer Science, Economics, Health and Physical Education, Recreation and Home Economics
- Bachelor of Science in Dental Hygiene, Medical Technology, Physical Therapy and Wildlife Biology
PROFESSIONAL SCHOOLS
Bachelor of Arts in Business Administration
Bachelor of Science in Business Administration
Bachelor of Arts in Education
Bachelor of Arts, from the School of Fine Arts, with majors in Art, Drama or Music
Bachelor of Fine Arts with major in Art or Drama
Bachelor of Music, from the School of Fine Arts, with majors in Applied Music and Theory or Composition
Bachelor of Music Education, from the School of Fine Arts, with majors in Elementary Music, Choral Conducting, Instrumental Conducting, Choral and Instrumental Conducting and Music Administration
Bachelor of Science in Forestry
Bachelor of Science in Pharmacy
Bachelor of Science in Radio-Television
Bachelor of Science in Resource Conservation
Bachelor of Arts in Journalism
Bachelor of Science in Fine Arts, with majors in Elementary Music, Choral Conducting, Instrumental Conducting, Choral and Instrumental Conducting and Music Administration
Bachelor of Fine Arts with major in Art or Drama
Bachelor of Music, from the School of Fine Arts, with majors in Applied Music and Theory or Composition
Bachelor of Music Education, from the School of Fine Arts, with majors in Elementary Music, Choral Conducting, Instrumental Conducting, Choral and Instrumental Conducting and Music Administration
Bachelor of Science in Forestry
Bachelor of Science in Pharmacy
Bachelor of Science in Radio-Television

ADVANCED PROFESSIONAL DEGREES
Bachelor of Laws
Juris Doctor

academic requirements ...

REQUIRED COURSES . . . Regular students must so arrange their studies, quarter by quarter, that they will normally complete all required courses and group requirements by the end of their third year at the University except in their field of specialization.

SPECIALIZATION . . . A student must select a major field of study before entering the junior year at the University.

MAXIMUM CREDIT LOAD . . . Except for students registering in an approved curriculum, the maximum credit load is 18 hours. To be included within the maximum of 18 credit hours are physical education courses and courses which carry no credit, such as English 001 and Math 001. Courses which carry no credit count toward the maximum load according to the number of class hours per week.

All requests for credits beyond the maximum must be approved by the student’s major dean (professional schools) or department chairman (College of Arts and Sciences).

MINIMUM SCHOLASTIC REQUIREMENTS . . . A student may be dropped from the University or placed on probation any quarter if his record is very unsatisfactory.

In order to graduate, a minimum grade-point average of 2.0 or 2.0 is required in (1) all college work attempted, (2) all college work undertaken at the University of Montana and (3) all work attempted in the major field.

A student on scholastic probation will be dropped at the end of the probationary quarter if his cumulative GPA fails to meet minimum standards, except that an average of 2.0 or better for work taken during a probationary quarter will allow such student to continue on probation.

A student dropped for the first time, after the lapse of three quarters from the time dropped, may be readmitted upon application to the registrar. A student thus readmitted is on scholastic probation. A student (a) dropped more than once or (b) wishing to be readmitted after the first time dropped, before the lapse of three quarters, may be readmitted only by the dean of the college or school to which he wishes to be admitted. A student so readmitted is on scholastic probation.

The burden of proving clearly that his case should be an exception to the rules is upon the student.

REPEITION OF A COURSE . . . If a course with credit earned is repeated and a passing grade or F is received, the first grade and credit are canceled and only the credit attempted and last grade received are counted, even if the last grade is lower. A second F (or more) for a course does not cancel an F. Unless repeated with a passing grade, all hours of F for an attempted course are used in calculating the grade-point average.

INDEPENDENT WORK . . . Credit is allowed superior students of junior and senior standing for independent work in courses in which they have a scholastic record equivalent to a 2.0 grade average in order to challenge a course.

A student who has credit for equivalent material in high school cannot receive University challenge credit for it.

Challenge credit will be granted on a grade of B or better earned in an examination which must be at least in part written.

Maximum challenge credit allowed is 30 credit hours with no more than 20 credit hours in any one department.

A fee of $3 per credit hour is charged. Such examinations are available only to regularly enrolled students.

GRADUATE STUDIES . . . The class work of the student will be rated as follows: A—work of the best grade; B—work better than average; C—work average; D—work below average, but barely passing; F—failure; X—not pass (no credit allowed, not counted in grade-point average); P—pass without defining the grade, credit applies toward graduation; I—incomplete (given if all the work in a course has not been completed and there is sufficient reason for this, will be changed to an F if the work is not completed during the student’s next quarter of attendance); N—work on the course may be continued in subsequent quarters (when work is completed, a final grade is assigned which applies to all quarters of the course); W—withdrawal from course.

Three systems of grading are used: (1) A through F—traditional letter grades; (2) Pass/Fail—applies only to (a) non-credit courses and (b) certain seminars and other courses in the 500-600 series stressing independent work, which are designated by the department or school and announced in advance. The P grade must apply to all registrants in the course; (3) Pass/Not Pass—in order to encourage students to venture into courses where they might otherwise hesitate because of uncertainty regarding their aptitude or preparation they may enroll in certain courses on a Pass/Not Pass basis. Any student may enroll on a Pass/Not Pass basis in Health, Physical Education and Recreation 100 courses. A freshman or sophomore with a grade-point average of 2.0 or better may, in addition, take no more than one resident undergraduate course per quarter on a Pass/Not Pass basis. Juniors and seniors may take more than one Pass/Not Pass course per quarter. No more than sixty Pass/Not Pass credits can be counted toward graduation. This
privilege does not extend to courses required for the student's major, except at the discretion of the department concerned. The grades of Pass or Not Pass are not formally defined in terms of their relationship to the traditional grades of A, B, C, D, or F; a "P" is given for work considered to be passing and therefore deserving credit, and an "X" for work not passed. All undergraduate courses offered on a Pass/Not Pass basis will also be offered on a letter-grade (A-F) basis. Courses taken on the Pass/Not Pass option will not be computed in a student's grade point average, but credits earned in courses graded Pass constitute degree credit up to the sixty-credit maximum. All courses taken and the grades received under the Pass/Not Pass option will be recent or current record. The total credit that can be accumulated with a result other than the letter A, B, C, D, or F will not exceed fifteen credits. The cumulative grade-point average is computed by dividing total grade points earned by the total number of hours undertaken, excluding non-credit courses, courses assigned W, P, X, I, or N and courses numbered under 100.

**QUALITY OF WORK . . .** A minimum grade-point average of "C" or 2.0 is required in (1) all college work attempted, (2) all college work undertaken at the University of Montana and (3) all work attempted in the major field.

To continue in third-year major courses, at least a 2.0 (C) average is required on all credits previously registered for and for which final grades have been received in major courses. This also applies to teaching majors.

**REQUIRED COURSES . . .** All candidates for the bachelor's degree must meet the following requirements:

1. **Physical education, 3 quarters (3 credits), required of all students unless excused for cause.** Discharged veterans and students 27 or more years of age are excused from this requirement. These 3 credits must be completed during the first two years of attendance.

2. **English composition may be required by schools or departments for any or all of their majors. English 100 must be taken during the freshman year. English 300 and 450, if required, may be taken in any order of the three remaining years, but in no case will any student be allowed to take both English 300 and English 450 in the same year.**

Placement in English is determined from the ACT examination. Those who fail to demonstrate an acceptable college standard must take English 001 and receive a "pass" before enrolling in English 100. English 001 is offered through the Extension Division.

Candidates for the advanced professional degrees, Bachelor of Laws and Juris Doctor, and who are graduates of an accredited college or university may be excused upon application from not to exceed 3 quarter credits of English composition.

**GROUP REQUIREMENTS . . .** All candidates for the bachelor's degree must present for graduation credits from the four groups listed below. Distribution requirements will be met by completing approved courses in groups as follows: Groups I and II. Complete Alternative A or B:

A. At least 12 credits in Group I or Group II with at least 8 of the 12 credits in one discipline; and an additional course of at least 3 credits in the other group. One of the courses must include laboratory work.

B. General 131-132 and two additional courses in Group II.

**Groups III and IV.** At least 12 credits in each of Groups III and IV; in each group at least 8 of the required 12 credits must be in one discipline.
requirements for graduation...

CATALOG GOVERNING GRADUATION . . . A student may graduate under University requirements for the year in which he was enrolled for the first time in any institution of higher education in the United States provided he completes graduation requirements within a continuous six-year period. If a student interrupts his attendance for a year or more, he must graduate under the catalog in effect at the time of readmission. A change of major requires the student to change only to major course requirements in effect at that time. A student may, with the approval of his college or department chairman, graduate under a later catalog than that under which he entered.

CANDIDACY FOR A DEGREE . . . Students at the University who are admitted as candidates for a degree must have satisfied the following conditions: (a) they must have fulfilled the entrance requirements of regular students; (b) they must complete the general University requirements showing a candidate for degrees or certificates must file formal applications with the registrar on the date specified on Official University Notices. Applications must be filed at least one quarter preceding the quarter in which requirements are to be completed.

CREDITS REQUIRED FOR A DEGREE . . . Normally credits assigned to a course are equated in the following way: one credit for each 50 minutes of lecture with two hours of preparation for the lecture expected of the student. Credit granted for laboratory work is normally one credit hour per period (one hour lecture or two hours laboratory per session). A total of 185 credits, including 3 credits of required physical education and excluding all other credits in basic physical education, basic ROTC, Mathematics 001 and English 001 is necessary in all courses for graduation with a bachelor's degree except that more are required in art, law and pharmacy. Candidates for the degree of Bachelor of Laws or Juris Doctor must complete three years of law totaling 90 semester hours in addition to the entrance requirements of the School of Law. Admission requirements of candidates for the degree of Juris Doctor include graduation from an approved college or university. Candidates for the degree of Bachelor of Science in Pharmacy must complete a five-year course. Candidates for the bachelor of fine arts degree from the College of Arts and Sciences must complete 93 credits in that college, except that credits in art and drama may be included. The professional degree, Bachelor of Fine Arts, requires 110 credits in art.

CREDITS REQUIRED FOR A MAJOR . . . Students may be required to complete from 45 to 70 credits in the chosen field. For degrees in education, the number of credits is from 40 to 45. Some curricula allowing 5 credits of a survey course to count as part of major requirements, the total maximum of 70 credits allowed in the major includes these 5 credits. This rule on maximum credits allowed does not apply in the Schools of Business Administration, Forestry, Journalism, Law and Pharmacy. Exceptions to these regulations may be made on the basis of entrance credits in the Departments of Foreign Languages and Mathematics.

CREDIT LIMITATIONS . . . Not more than 18 credits in advanced ROTC courses nor 15 credits in religion may be counted toward graduation. Credit in denominational religion courses is not accepted. Except in the music department, not more than 12 credits in performance music (Music 100, 201 through 401, 114 through 119; 125, 126, 127, 128, 129, 130) nor 6 credits in ensemble music (Music 105 through 110, and 140) may be counted toward graduation.

Only students majoring in business administration or those taking business courses for career or recreational interests in business administration are allowed to present more than 19 credits earned in Business Administration 180-181-182, 183, 184-185-186, 187-188-189 and 190-191.

CORRESPONDENCE STUDY . . . . Up to 30 credits earned by correspondence study may be counted toward graduation.

REQUIREMENTS OF PARTICULAR CURRICULA . . . Candidates for a bachelor's degree must comply with any requirements announced under a particular curriculum, in addition to meeting the general requirements listed here under requirements for graduation.

SENIOR EXAMINATIONS . . . Some departments and schools in the University require a senior comprehensive examination as part of graduation requirements. This examination does not in any way replace the regular quarterly examinations except that departments adopting or using these senior examinations may excuse their major students during the senior year from regular quarterly examinations in major department subjects. The examination is a written examination of at least three hours length, and additional oral or written examinations may be given. Examinations are given the last quarter of senior residence and are arranged in each department or school at the convenience of the persons concerned. If the student fails to pass this special examination, he shall be given another opportunity within the next six months without the necessity of taking additional courses. In case of a second failure, further opportunity will be granted at the discretion of the department or school concerned and the committee on graduation. For details, check under the alphabetically listed curricula in the catalog.

GRADUATION WITH HONORS OR HIGH HONORS . . . A student with a grade-point average at the beginning of his senior year of 90 or better for all credits attempted on his entire record as well as in the major field will be graduated with honors. To graduate with high honors, the student must meet these requirements with a grade-point average of 94 or higher, and in addition, must pass an honors examination (written or oral) administered by the department or school. The results of such examinations are to be certified by the department chairman or dean to the registrar as "A" or "B" level.

A student who transfers credits earned elsewhere to this university must meet these requirements on grades earned at the University of Montana as well as on his entire record. After these qualifications have been met, the candidate for honors or high honors must receive the recommendations of his major department and the faculty of the University of Montana.

In the School of Law, the grade-point average is computed on law credits only.

summer session . . .

The summer session consists of two 4 1/2 week half-sessions and a concurrent nine-week session. Students may attend either half-session or the full nine-week session. The 1971 summer session will open June 21 and close August 20; the first half-session, June 21 to July 21; the second half-session, July 22 to August 20.

Regular University students may accelerate their programs by taking summer classes. Students may earn 16 quarter credits in the nine-week session.

Completion of 45 credit hours, including one full summer quarter, will satisfy the residence requirements for the master's degree.

Courses will be offered in all of the basic arts and sciences, as well as in the areas of business administration, education, journalism, pharmacy and fine arts. Both graduate and undergraduate work are offered in most of these areas.

Courses required for Montana secondary and elementary teachers certificates will be offered. Graduate work will include courses for secondary teachers, elementary teachers and for administrator's credentials.

Special field work in botany and zoology is given at the University Biological Station at Flathead Lake. Regular courses in botany and zoology are given on the campus.

Full information regarding the summer session may be obtained from the individual department or school of instruction or from the coordinator of summer session.
the graduate school...

For information on graduate degrees offered, admission to the Graduate School, general requirements for graduate degrees and graduate courses, write to the dean of the Graduate School.

Detailed information on requirements for particular degrees, a copy of the Graduate School Catalog, and application forms for admission to graduate work may be secured by writing to the dean of the school or the department chairman involved. Send complete return address, including zip code number.

financial obligations...

PAYMENT OF FEES by check in exact amount of bill is preferable. Personal checks are not cashed except in payment of University bills. Foreign checks in U.S. Funds are subject to bank clearing charges. Currency or checks that are not in U.S. funds should be exchanged at a local bank before payment is made to the University.

SUMMARY OF EXPENSES... This does not include fees for special purposes such as applied music and forestry. Married students living in University-operated family housing pay rental rates varying from $66 to $114 a month depending on the size and type of apartment. Board and room rates probably will hold for the year. However, in the event of material increases in costs, rates may be increased accordingly.

<table>
<thead>
<tr>
<th>Montana Resident Fees</th>
<th>Autumn Quarter</th>
<th>Winter Quarter</th>
<th>Spring Quarter</th>
<th>Total For Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Res. Halls Board</td>
<td>$218.00</td>
<td>$194.00</td>
<td>$194.00</td>
<td>$418.00</td>
</tr>
<tr>
<td>Room (Double)</td>
<td>$98.00</td>
<td>$98.00</td>
<td>$98.00</td>
<td>$294.00</td>
</tr>
<tr>
<td>Books, Supplies, Est.</td>
<td>$50.00</td>
<td>$50.00</td>
<td>$50.00</td>
<td>$150.00</td>
</tr>
<tr>
<td>Total Mont. Res.</td>
<td>$204.00</td>
<td>$190.00</td>
<td>$190.00</td>
<td>$584.00</td>
</tr>
<tr>
<td>Students not residents of Montana add:</td>
<td>$222.50</td>
<td>$222.50</td>
<td>$222.50</td>
<td>$667.50</td>
</tr>
<tr>
<td>Total non-res.</td>
<td>$426.50</td>
<td>$382.50</td>
<td>$382.50</td>
<td>$1,190.00</td>
</tr>
</tbody>
</table>

*Non-refundable applications admission fee not included (see admissions).

NON-RESIDENT STUDENTS are those minors whose parents are non-residents and others who, though legally entitled to establish their own residence, have not complied with Montana law to do so. For more information, prospective students write to the director of admissions and others to the registrar.

STUDENT FEES... The following is a detailed schedule of quarterly fees authorized for the University year 1970-71 in all schools and departments except where otherwise specified. For the law school, which is on a semester plan, the semester fees will be 50% above the quarterly fees. Fees are subject to modification by action of the State Board of Regents.

Registration is not complete until all fee charges are paid and registration cards turned in at the Registrars Office.

The University offers no deferred payment plans. Students are expected to make financial arrangements prior to registration. The Financial Aid Office will try to help you solve your financial problems. Students should be financially able to attend at least one quarter without assistance. New students with cash scholarships, grants and merit of awards must notify the Scholarship Officer of the University well in advance of registration week if they wish to use these funds during the Autumn quarter.

ALL STUDENTS REGISTERED FOR SEVEN OR MORE CREDITS

| Registration | $ 15.00 |
| (Many honor scholarships entitle the holder to a waiver of the registration and incidental fees) |
| Incidental (for laboratory supplies in all courses, diploma, etc.) | $60.00 |
| Building | $20.00 |
| Student Union | $10.00 |
| University Center Operating | $5.00 |
| Student Activity | $15.00 |

For support of activities sponsored by the Associated Students of the University of Montana.

(Required of all students enrolled for class work.)

For support of activities sponsored by the Associated Students of the University of Montana.

Non-residents (out-of-state) pay, in addition to the fees listed above, per quarter ($200.00 plus $225.00 building fee) $225.00.

(If registered for less than 7 credits, the non-resident fee is based on a charge of $100.00 plus an additional non-resident building fee. Refer to the forestry and music sections for information on additional forestry and music fees.

WAR SERVICE FEE EXEMPTIONS... The registration and incidental fees are waived for honorably discharged persons who served with United States armed forces in any of its wars and who were bona fide residents of Montana at the time of their entry into the armed forces. This is in accordance with an act of the Legislature of 1943 as amended by the Legislature of 1945. These exemptions are not available to students who are eligible to qualify for benefits under federal laws. Students must apply for these war service exemptions, at which time the original or certified copy of discharge must be submitted for identification purposes.

REGISTRATION UNDER P.L. 634 or 815... Subsistence payments from the Veterans' Administration are based on the number of hours of work for which the student is registered. A minimum of 14 credit hours is required for full payment.

LIMITED REGISTRANTS (students registered for less than seven credits): registration fee $15; incidental fee $30; building fee $10; Student Union $5; University Center Operating $25; Health Service $13; student activity $15 (optional). Non-residents pay in addition to other fees stated here, $100 plus $112.50 additional non-resident building fee. Students who are enrolled as regular students who wish to drop to limited registrants should see statements under regular refund schedule.

LISTENERS (students who enroll for courses without credit) pay the same fees as students enrolled for credit. This applies to regularly registered students only.

GRADUATE STUDENTS pay the same fees as undergraduate students except that graduate students whose programs require expensive equipment, laboratory supplies and additional books may be required to pay a graduate laboratory-incidental fee not to exceed $50 per quarter. The student activity fee is optional to students who have a B.S. or B.A. degree.

TERMINAL GRADUATE STUDENT FEE... A $25 per quarter fee is charged graduate students, both resident and non-resident, who are not enrolled in courses but whose activities involve the use of University resources.
### Fees for Special Purposes...

**Late Registration:** The charges are $10 for the first day late, maximum $2 for each day of instruction thereafter, a maximum of $24, payable by students who did not register during the period designated for registration, unless their late registration was due to the fault of the University. This fee is payable by students who register during the prescribed registration period except for payment of fees.

**Dishonored Checks:** "A service charge of $2.50 will be assessed each time a check is returned; this amount will be charged to the individual's account, and he will be so notified. If it is not cleared within five days, a second notice will be sent and appropriate administrative action will be taken."

"Any check tendered in payment of registration fees and returned by the bank may result in postponement of the student's registration, and the student will then be subject to the late registration fee."

**Change of Enrollment:** Effective the fourth day of classes, $2.

**Special Examination:** For each special examination, $2; maximum, $5 for any one quarter.

**Removal of Incomplete:** $2 per course.

**Transcript of Record:** $1 each after the first which is free of charge.

**Credit by Examination:** A fee of $3 per credit hour is charged.

**Field Trips:** Certain departments require field trips, the cost of which is a personal expense prorated among the students in the course. Check the department involved for details.

**Summer Fees** are listed in the Summer Session and Biological Station bulletins.

**Refunds...** All fees, except the $15 registration fee and the $10 admission application fee are refunded to students who withdraw before the beginning of classes. No fee refunds are made after the fourth week of instruction (except music). Students who withdraw after the beginning of classes but before the end of the fourth week will be refunded according to the refund schedule published below.

Applied music refund is based on a charge of $1.75 per 1/2-hour lesson for the number of weeks elapsed since the beginning of the quarter.

The Remedial English, Remedial Math, Forestry Fee and Music Building Fee are refunded at 50% during the first week of instruction. No refunds are given thereafter.

Refunds are calculated from date of application for refund and not from date of last attendance at classes except in cases of illness or other unavoidable causes. No refunds are made if application for refund is delayed beyond close of quarter for which the fees were charged.

### Regular Students

<table>
<thead>
<tr>
<th>Week of Instruction</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Incidental</td>
<td>75%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Building</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Student Union</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>University Center Operating</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Student Activity</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Health Service</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

*(No refund if medical service furnished or physical examination taken.)*

**Non-Resident Tuition** 80% 60% 40%

After the third week of instruction, there shall be no refunds of fees except that in the fourth week of classes, 20% of the non-resident fee will be refunded.

### Regular Students Who Drop to Limited Registrants

<table>
<thead>
<tr>
<th>Registration</th>
<th>None</th>
<th>None</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidental</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Building</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Student Union</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>University Center Operating</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Student Activity</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Health Service</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Non-Residents</td>
<td>40%</td>
<td>30%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Student Organizations...

The University encourages a full and well-rounded program of activities designed to stimulate students' intellectual, vocational, and social interests. Among the types of student extracurricular activities programs for University students and faculty.

**Athletics...** Athletics, including intercollegiate athletics, are a useful and valuable part of the University program for the development and growth of interested students. Facilities are provided for participation in some form of athletics by every student. Aid to students participating in athletics may be given only in conformity with the regulations of the National Collegiate Athletic Association and the Big Sky Athletic Conference, of which the University is a member.

**University Center...** The University Center (Student Union), houses a significantly expanding extracurricular-activities program for University students and faculty.

The building includes student legislative chambers, offices, lounges, work areas, music listening rooms, hobbies and craft areas, art gallery, conference areas, ballroom, coffee shops, bowling lanes, billiard and ping pong areas and food services.

In addition students have access to a nine-hole University golf course and a large modern swimming pool.

### Student Services...

The **Counseling and Testing Center** has a general function of giving guidance and assistance to students in the following areas: (1) selection of appropriate area of major study; (2) assessment of abilities and the most efficient, effective application of those abilities to allow for maximum learning in college; (3) diagnosis of difficulties leading to less than maximum performance academically and professionally; and (4) selection of appropriate vocational area.

The Counseling and Testing Center has a further responsibility to (1) administer, report and aid in the interpretation of personal placement tests and other standardized tests; (2) act as a consultant to University departments and high schools in the establishment of effective testing programs; (3) assist University personnel and welfare groups in their guidance function; and (4) assist advisers, on request, in working with students.

Services of the Counseling and Testing Center are available without charge to regularly enrolled students. Charges are made for services to non-students.
THE STUDENT HEALTH SERVICE is available to registered students who pay the Student Health Service fee. This service safeguards the health of students through health education, preventative medicine and medical treatment of acute diseases.

The services provided are comprehensive and include medical consultation and advice from the University's full-time physicians and from certain consulting specialists in the local medical society. The student is protected by this service only while enrolled and not during vacation periods or between quarters. Therefore, it is strongly suggested that students enroll in the supplemental Blue Cross health insurance program which is inexpensive and extends protection to the student through the vacation periods between quarters and during the summer. This insurance is offered at the time of registration.

The Health Service Building contains a dispensary and semi-private patient rooms for students requiring confinement for general medical care or isolation for communicable diseases. The Health Service staff includes physicians, nurses, laboratory technician and an X-ray technician. Facilities are available 24 hours a day with dispensary hours from 9 a.m. to noon and 1:30 to 5 p.m.

A medical examination, tuberculin skin test (or chest X-ray) and immunizations are required of all entering students. These are performed at the student's own expense and at the student's expense before he arrives on campus. A health record containing the above information must be submitted to the University prior to registration.

Health Service privileges are not available to members of the faculty or members of the student's family (see below for family protection under Blue Cross). Obstetrical care and non-emergency hospitalization are not covered. Illnesses arising from activities contrary to University regulations or due to use of alcohol or drugs are not covered. Injuries resulting from automobile accidents are not covered; therefore, it is advised that automobile insurance be adequate to take care of medical costs.

Hospitalization in local hospitals is provided when necessary through the Student Health Service. The Health Service may pay for 15 days hospitalization at $15 per day, and $100 may be applied to extras (medicine, X-ray and laboratory work). The Health Service Building also houses the State Mental Hygiene Clinic.

THE OPTIONAL BLUE CROSS SUPPLEMENTAL HEALTH PLAN has been worked out through the Faculty-Student Health Committee to make it possible for students to obtain low-cost year-around health care protection during the four or more years they are undergraduates at the University of Montana and to allow married students health care protection for their dependents. Under this plan, which costs the single student $3.50 per quarter for the autumn, winter and spring quarters and $5.00 for the summer, the student may protect himself against the costs of illnesses that exceed 15 days per quarter of hospitalization (the limit under the Student Health Service Plan) and illness and accidents occurring between quarters and during the summer months. The married student, under this optional plan, can gain health care protection for his wife and dependents with one of three optional plans ranging in cost from $22.20 to $66.00 per quarter for the autumn, winter and spring quarters and for the summer session. Details of the plan are available from Montana Blue Cross, 3300 10th Avenue South, Great Falls, from the Dean of Students Office and from the University Health Service.

THE SPEECH AND HEARING CLINIC provides needed services, without charge, to any student desiring them. These services include detailed diagnostic evaluations, consultation, therapy and referral to other clinics as individual needs are indicated.

THE PLACEMENT CENTER endeavors to assist University graduates in finding positions suitable to their interests and professional training. These services are available to the graduates of any college, school or department of the University.

Interview schedulings, employer information and vacancy listings are available for positions in schools, colleges, business, industry and government service. The Placement Center also aids University graduates in later years in finding new positions for which both a degree and experience are required.

University placement services are provided free of charge to graduates except for a $5 fee for compiling credentials. No additional charge is made in subsequent years. All University graduates are required to live in University residence halls unless excused as special cases by the dean or associate dean of students.

REGULATIONS . . . Freshman students, both men and women, who are unmarried and between 21 years of age and who are not living in their own homes while attending the University are required to live in University residence halls unless excused as special cases by the associate dean of students.

Women students between the ages of 21 and 24, inclusive, may live in the residence halls only as space is, or becomes, available. Women between these ages who are living in residence halls will be held to the academic year contract if they are not expected to live in the halls after they became 21; (2) failed to exercise their option to move out at the beginning of the quarter during which they became 21; (3) failed to exercise their option to move out at the end of the quarter during which they became 21.

With the above exceptions, all students who contract to live in the residence halls (men's or women's) do so for the entire academic year or that portion of it for which they are enrolled.

RESIDENCE HALLS AND FOOD SERVICE . . . Application forms and detailed information may be obtained by writing the Admissions Office, University of Montana. A prepayment on board and room, as announced in the residence halls bulletin, must accompany each room application. If a room reservation is canceled, notice in writing must be received by the manager of residence halls on or before September 22 for fall quarter, January 2 for winter quarter and March 24 for spring quarter. Students who live in the residence halls are required to board at the Food Service. See Residence Halls Bulletin for board and room rates.

Dormitory charges must be paid in advance at the beginning of the quarter or in instalments as arranged with the Financial Aid Office.

Social life in the halls is encouraged through residence hall clubs and numerous activities. Adult and upper class counselors cooperate with the students in making living in the halls enjoyable and beneficial. A fee of $2 per quarter is assessed the residents in each hall.

Board is provided by the Food Service for the residents of all halls. Experienced dietitians provide appetizing and nutritionally adequate meals.

All University food and housing operations are conducted on a self-sustaining basis. Land is acquired, buildings are built and maintenance and operation are financed out of payments for such housing or meals. When costs go up, charges for these services must go up unless the services themselves are to be reduced to suffer un pity in quality or quantity. New or additional services, when demanded, also require additional charges. Such charges are fixed from time to time, effective on the dates similarly specified.

FAMILY HOUSING . . . Married students may apply to the Family Housing Office for accommodations in modern, moderately priced apartment-type units located within walking distance of the university campus. Stu dents, with one, two, three and four bedrooms are available.

THE WOMEN'S COOPERATIVE HOUSE provides an opportunity for women to gain experience in group living while reducing living expenses by sharing in the work of the house. This residence is under supervision of an approved
housemother. Information may be obtained by writing to
the President of the Synadelphic House, in care of the Dean
of Students Office.

FRATERNITY AND SORORITY HOUSES . . . Nine na-
tional fraternities and six national sororities maintain their
own residences under University supervision. Membership
in fraternities and sororities is by invitation, but eligibility
for membership is based on satisfactory scholarship accom-
plished in high school or the college previously attended.
Eligibility for initiation is based on satisfactory academic
performance in the University. Sorority houses are under
the immediate supervision of resident housemothers who are
appointed with the approval of the associate dean of stu-
dents.

FINANCIAL AID . . . The University participates in
the College Scholarship Service (CSS) and the ACT Student
Need Analysis Program, which assists in determining the
student’s need for financial assistance. Undergraduate and
graduate students are eligible for many kinds of financial
aid, including (1) National and State—Educational Op-
portunity Grants, Guaranteed Loan Program, Fee Waivers, Law
Enforcement Educational Program, National Defense Student
Loans, College Work-Study Programs and Veterans Bene-
fits; (2) General University—Scholarships, Loans, Awards
and Prizes; (3) Specific University—programs under various
schools and departments. Application deadlines for many of
the programs are in March and April.

For more information or for copies of the complete listing
of University Financial Aid, write to: FINANCIAL AID
Office, University of Montana, Missoula, Montana 59801.
High school counselors have financial aid applications and
detailed information.

standards of student conduct . . .

Misconduct for which students are subject to probation
or suspension from the University falls in the following cate-
gories:

(1) Dishonesty, such as cheating, plagiarism, or know-
ingly furnishing false information to the University.

(2) Forgery, alteration, or misuse of University docu-
ments, records or identification.

(3) Obstruction or disruption of teaching, research, ad-
ministration, disciplinary procedures, or other University
activities or of other authorized activities on University
premises. Such obstruction or disruption, whether involving
individuals or group conduct, and whether taking the form of
force, trespass, seizure, occupation or obstruction of build-
ings, facilities or property, or of other conduct having such
obstructive or disruptive effects, or the inciting of others to
any conduct having such effects, is directly opposed to the
maintenance of academic freedom and to the accomplish-
ment of the mission of the University.

(4) Physical abuse of any person on University-owned
or controlled property, or on the property of fraternities,
sororities, or cooperative houses or at University sponsored
or supervised functions, or conduct which threatens or en-
dangers the health or safety of any such person.

(5) Theft of or damage to property of the University
or of a member of the University community or campus
visitor.

(6) Unauthorized entry or use or occupancy of Univer-
sity facilities.

(7) Violation of University policies, rules or regulations
concerning student organizations, the use of University fa-
cilities, or the time, place and manner of meetings or demon-
strations on University-owned or controlled property.

(8) Use, possession or distribution of dangerous drugs
except as expressly permitted by law.

(a) Liquor: the use or possession of intoxicating liquor
(including beer) in the buildings and on the
grounds of the University or in residence halls and
quarters of other University-approved living groups
or at functions of University students or University
organizations (including athletic events) is forbid-
den. Furthermore, University students are expected
to abide by state and federal laws in the use or
possession of intoxicating liquor or drugs.

(b) Drugs: use, sale or possession of various drugs
including opium, heroin, cannabis, marijuana, In-
dian hemp, peyote, mescaline, L.S.D., stimulants,
and depressants are made illegal under both federal
and state laws. The punishment for violating these
laws is very severe with conviction often resulting in
long prison sentences. This is the law. Every
student should be fully aware of the risks involved
in violating the drug laws.

(9) Violation of University regulations governing stu-
dents who live in University-owned or controlled property,
or in fraternities, sororities, and cooperative houses.

(10) Disorderly conduct or lewd, indecent, or obscene
conduct or expression on University-owned or controlled
property, or on the property of fraternities, sororities, and
cooperative houses, or at University sponsored or supervised
functions.

(11) Failure to comply with directions of University
officials acting in the performance of their duties.

(12) Freedom of expression: “The Faculty Senate re-
affirms that a fundamental right in the University is the
freedom of expression and that it must be upheld. Freedom
of expression includes peaceful assemblage and demonstra-
tions which does not interfere with the normal operation of
the University.” Demonstrations which do not involve con-
duct beyond the scope of constitutionally-protected rights
of free speech and assembly are permissible. However,
conduct which is otherwise improper cannot be justified merely
because it occurs in the context of a demonstration. Demon-
strations which involve disorderly conduct, physical abuse of
any person, conduct which obstructs or disrupts authorized
activities of others upon the campus, conduct which involves
misuse of University facilities, or failure to comply with
directions of University officials, or conduct which
otherwise goes beyond constitutionally-protected rights and
is a violation of any law, ordinance, or University rule, regu-
lation or policy, will not be permitted. Students will be
charged with misconduct for any individual misconduct com-
mitted by them in the course of a demonstration.

(13) Unpaid bills: individual students who owe bills to
the University for fees, fines, board and room in the resi-
dence halls and other charges are not permitted to register
for the succeeding quarter, secure transcript of record or
obtain diploma unless the obligation is paid or satisfactorily
adjusted. Similar action is taken when students owe bills to
student organizations whose books are kept in the Business
Office of the University of Montana, including charges for
board and room in fraternity and sorority houses.

(14) Use of motor vehicles: students who bring motor
vehicles to the University campus must register them with
the Traffic Security Office of the University. Regulations
relative to the use of motor vehicles on the campus may be
obtained there. (See Student Fees)

Because the University Health plan does not cover injuries
sustained in motor vehicle accidents and the optional Stu-
dent Blue Cross policy (if taken) limits liability to $1,000,
all students would be adequately covered by insurance
(liability, property damage, medical payments, etc.)

(15) Student marriages: the Montana Statutes on mar-
rriage require (a) parents’ (or guardian’s) consent for men
under 21 and women under 18 years of age; (b) a five-day
waiting period between the times of application and issuance
of the marriage license; and (c) a blood test for both parties.
Persons residing in Montana who attempt to evade any of
these requirements by excursions into neighboring states run
the risk of having the validity of their marriages questioned,
conceivably at a later date.

University students are expected to abide by the spirit and
intensity of the Montana law and, furthermore, must report
their marriages to the Dean of Students Office immediately.

(16) Right of appeal: students who for disciplinary
reasons have been suspended from the University have a
right to appeal by letter to a faculty-student Board of Judicial Review within three academic days following their suspension.

The Board of Judicial Review is made up of four full-time faculty members selected by the Faculty Senate and three student members chosen by Central Board, governing body of the Associated Students. If three members of the board agree that the case should be reviewed, the student is given a hearing. His status as a student does not change during the period of the review.

After hearing the case, the board reports its recommendation to the dean of students, who either accepts the recommendation or, in the event he disagrees, refers it to the president of the University for final decision.

A complete outline of the organization, functions and procedures of the Board of Judicial Review may be obtained from the office of the dean of students.

Occasionally a student has a disagreement with a University staff member concerning which he feels he should have a right to appeal. In such an event, he should consult the dean of students for advice.

(Note: A new judicial system is under consideration by faculty, students and administration and may go into effect during the 1970-71 academic year.)

ABSENCE FROM CLASS...

DUE TO ILLNESS: Students who are confined to the infirmary or who report to doctors at the infirmary may receive excuses directly from the Health Service for the time they have been so confined or detained by the doctors. The Health Service is not authorized to give excuses except in instances where the student has actually used its services. All other excuses must come from the Dean of Students Office.

DUE TO EXTRA-CURRICULAR ACTIVITIES: When a student's absence from classes is due to his participation in extra-curricular activities, i.e., athletics, debate, drama, etc., the time of his absence must be reported in advance to the dean of students by those in charge of the activity. In all cases, students must fill out a leave of absence card obtained from either the Dean of Students Office or the person in charge of the activity. This card must be presented to the students' instructors for their signatures before being returned to the Dean of Students Office.

DUE TO FIELD TRIPS: At least two weeks in advance of a proposed field trip, the instructor in charge should send a memorandum to the dean of his school or college stating the proposed arrangement and date of the trip as well as the list of the students who will be participating. If the dean of the school or college approves the trip, he will submit the memorandum to the Dean of Students Office for final approval. When this is given, the staff member in charge will receive from the Dean of Students Office leave of absence cards which will be distributed to the affected students. Each student is responsible for having his cards signed by his various instructors and returned to the Dean of Students Office for filing.

LEAVES OF ABSENCE: A student who is compelled for personal reasons to be absent from the University should obtain a leave of absence in advance from the Dean of Students Office and from his instructors. In case of emergency when it is not possible for the student to see his instructors, the student should notify the Dean of Students Office or the Registrar's Office of his intended absence.

In all cases, work which a student has missed through absence must be made up as his instructors direct.

organization of instruction...

For administrative purposes, various courses and curricula are organized within departments, schools or colleges as shown immediately following. The detailed listing of curricula and courses later in the catalog is alphabetical and includes combined curricula.

<table>
<thead>
<tr>
<th>COLLGE OF ARTS AND SCIENCES</th>
<th>( \text{Home Economics} )</th>
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<tbody>
<tr>
<td>( \text{Biophysics} )</td>
<td>( \text{Chemistry} )</td>
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<tr>
<td>( \text{Computer Science} )</td>
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<td>( \text{General Business} )</td>
<td>( \text{Radio-Television} )</td>
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</tbody>
</table>

ORGANIZATION—23

SCHOOL OF LAW

SCHOOL OF PHARMACY

RELIGIOUS STUDIES (no major)
courses of instruction...

ANTHROPOLOGY is the study of man. As a social science it is concerned with people, cultures, and societies on a world-wide scale throughout time. It studies institutional arrangements under which people live, their psychological adjustments to different cultures, and their languages. Emphasis is on primitive or preliterate societies, but the field also includes human evolution, archaeology, and the application of anthropological principles to an understanding of complex civilizations. Bachelor of Arts and Master of Arts degrees are offered in anthropology.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE: In addition to the general requirements for graduation listed earlier in the catalog, 30 credits in anthropology courses or approved cognate courses listed below are required for the Bachelor of Arts degree. A foreign language is required. (See foreign language requirement in the general section of the catalog.) Credits taken in anthropology must include the following groups and one course in ethnology and one course in archaeology.

The origins, backgrounds and development of pre-Columbian civilizations. Bachelor of Arts and Master of Arts degrees are offered in anthropology.

GRADUATE WORK. See Graduate School Bulletin

FOR UNDERGRADUATES
For Explanation see Course Descriptions (Index)

119 PHONETICS see Speech Communication 119.

152 MAN AND HIS CULTURE 5. The origin and development of man and his culture, and the processes involved in culture change, e.g., acculturation, diffusion.

153 CULTURAL ANTHROPOLOGY 5. The social life of man; his family structures, his groups and institutions—economic, religious, and political processes used by people in preliterate societies and early civilizations.

154 RACE AND MINORITIES 3. Problems of assimilation of racial and cultural minorities.

251 PRIMITIVE TECHNOLOGY 3 prereq 152 or 153. Technological processes used by people in preliterate societies and early civilizations.

265 INTRODUCTION TO FAR EASTERN CULTURE 4 prereq 153 or =. The society, religion, and other aspects of life in the Far East.

FOR UNDERGRADUATES AND GRADUATES
*Course offered every other year

308 *RACE AND ETHNIC RELATIONS 3 prereq 154 and Soc 101. Racial and ethnic differentiation and its social consequences. (Credit not allowed for this course and Sociology 304.)

325 EDUCATIONAL ANTHROPOLOGY 3 prereq 152 or =. Major anthropological concepts of history, prehistory, culture and society. (For educators and social workers or others dealing with American Indians and other minority groups.)

340 *PRIMITIVE RELIGION 3 prereq 152 or 153 and one course in ethnology. Theories and practices of the supernatural phenomena found among primitive peoples throughout the world.

351 *PREHISTORIC CULTURES 3 prereq 152 or 153 or =. Prehistoric man and his cultures, up to the Neolithic, in Europe and the Near East.

352 *ARCHAEOLOGY OF MONTANA 3 prereq 152 or 153 or =. The origins and distribution of aboriginal cultures in Montana and surrounding regions. Students are required to attend a minimum of nine field trips in which actual archaeological sites will be excavated and techniques demonstrated.

353 *ARCHAEOLOGICAL SURVEY Any quarter in which field parties are organized. V 3-9 R-12 prereq 152 or 153 or =. A field course in Montana archaeology.

354 *OLD WORLD ARCHAEOLOGY 4 Su 3 prereq 152 or 153 or =. The development of civilization from the Neolithic Age to the dawn of written history.

355 *ARCHAEOLOGY OF NORTH AMERICA 4 prereq 152 or 153 or =. The origins, backgrounds and development of pre-Columbian North American peoples and cultures.

356 HISTORICAL ARCHAEOLOGY 3 prereq 152 or 153 or =. The location and evaluation of historical sites in Montana and the Northwest. Techniques utilized in excavating historical sites and systems for the classification of historical site artifacts.

course numbering system . . .

001-099 Courses below college level. Credit not allowed toward graduation.

100-199 Freshman Courses

200-299 Sophomore courses

300-399 Junior courses

400-499 Senior courses

500-699 Graduate courses

In the School of Pharmacy, senior courses (5th year) are numbered 500 to 599.

Courses are listed under headings, FOR UNDERGRADUATES, FOR UNDERGRADUATES AND GRADUATES, or FOR GRADUATES. Courses listed under the first heading may not be taken for graduate credit even if the numbers are in the 300 or 400 series. Courses under the second heading may be taken for graduate credit if the student secures proper authorization from the Graduate School. Courses under the last heading may be taken by graduate students only.

Thesis and independent studies courses may be so listed as to provide for indiction of the subject matter on the permanent record, provided the topic is printed in the schedule of classes.

course descriptions . . .

When reading course descriptions, please note the following:

COURSE NUMBERS: 150, 207-208, 121-122-123, illustrate courses of one quarter, two quarters and three quarters. Hyphenated numbers indicate a course with the same title in a two or three quarter sequence. Unless otherwise stated in a description, 207 would be required before a student could take 208, 121 before 122, 122 before 123.

NUMBER CHANGES: 150 (101) illustrates a course for which the number has been changed from 101 to 150. Numbers formerly used are shown in parenthesis.

QUARTERS: A, Autumn; W, Winter; S, Spring; Su, Summer.

CREDITS: The number following the course title indicates the number of credits for which the course is offered. In two or three quarter sequences, the credits may vary from quarter to quarter in which case the quarter will be indicated along with the credit. (A 5, W 4, S 3, Su 2, etc.)

VARIABLE CREDIT COURSES: A V indicates variation or a specific variation such as V 1-3. Such numbers may be followed by R or an R followed by a number which would indicate that the course might be repeated for credit and the total credits allowed for the course (R-10, etc.).

LECTURE AND LABORATORY: (3-4) illustrates a class with 3 hours of lecture and discussion per week and 4 hours of laboratory. (0-3 cr.) illustrates a laboratory course in which the student has 3 hours of laboratory per week for each credit.

ALTERNATE YEARS: Courses not offered every year may be designated by a/y, e/y or o/y (alternate, even, or odd year) following credits (4 e/y).

PREREQUISITES: As indicated above, some courses require pre or co- prereq, followed by numbers, indicates the courses necessary before taking this course. Unless otherwise stated, the numbers are courses in the same department as the course listed.

COREQUISITE: Abbreviated coreq, indicates the courses that must be taken concurrently.

CONSENT OF INSTRUCTOR: If required, is shown by c/i.

EQUAL OR EQUIVALENT COURSE: Shown by an equal sign (=).

The quarter during which courses will be offered will be indicated in a separate schedule of classes.

The quarter during which courses will be offered will be indicated in a separate schedule of classes.
ART—15

ART

The Art Department functions as an instructional unit, a center for research and development in the visual arts. It is a focal point for exhibitions, lectures, discussions, and other means of presenting the work of the visual artist to the university and the community. Its essential intention is the integration of tradition in the visual media with the present complex of interrelationships among the artistic disciplines which we experience in contemporary society.

The Art Department offers the following degrees: Bachelor of Arts, Bachelor of Fine Arts, Master of Arts in Art, and Master of Fine Arts. The specific requirements for the respective Masters’ Degrees may be found in the Graduate School Catalog.

The Department reserves the right to retain, exhibit, and reproduce student work submitted for credit.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN ART. In addition to the general requirements for graduation listed earlier in the catalog the following requirements must be completed for the Bachelor of Arts Degree with a major in Art: 53 or more credits (up to a maximum of 70) including Drawing 12 cr., Design 6 cr., Painting 6 cr., Sculpture 9 cr., Ceramics 2 cr., Printmaking 2 cr., Lettering 2 cr., Photography 2 cr., and electives as desired or needed. One quarter of English composition must be completed.

The Foreign Language requirement listed earlier in the catalog must be satisfied.

The Bachelor of Fine Arts is a professional degree requiring 110 credits in art, distributed as follows: Drawing 12 cr., Painting and Watercolor 15, Design 6, Ceramics 6, Printmaking 6, Photography 6, Lettering 2, Art History 15, Sculpture 12 and art electives 35 credits. Ninety credits are required outside of the department. All general university requirements except foreign language must be completed. Fourteen quarters are usually required to complete this degree.

A student may apply at the beginning of the Sophomore year or later and must have at least a 3.0 index in Art and a 2.5 in academic work. A portfolio, slides or an exhibition (or both) must be presented.

Course requirements for a degree in education with a teaching major or minor in art are listed under Education.

Suggested first year program:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>A</th>
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</table>

GRADUATE WORK. See Graduate School Bulletin

FOR UNDERGRADUATES

*CHINESE SOCIAL ANTHROPOLOGY 3 prereq 395 or =. The cultures of the Indians of South America.

195 *PEOPLES OF AFRICA 4 prereq 152 or 153 or =. The peoples and culture of Africa.

204 *PEOPLES OF INNER ASIA 4 prereq 152 or =. The social structures, religion, and subsistence patterns of Inner Asia.

255 *INDIANS OF MONTANA 3 prereq 152 or 153 or 10 credits in social science, and c/i. The history and culture of the Indian tribes of Montana.

398 NORTHEAST ETHNOLOGY Any quarter in which field parties are organized. V 1-5 R-12 prereq 152 or 153 or = and c/i. A field course. Indian tribes of Montana and related areas.

286, 485 and c/i. Independent research and seminar discussion.

FOR GRADUATES

220 PRECEPTORIAL READINGS V R-9 prereq 152, 153, and 10 upper division credits in anthropology. Readings in the major divisions of anthropology, ethnology, etc.

551 RESEARCH V.


699 THESIS V R-9.
ASTRONOMY

ASTRONOMY is the oldest of the physical sciences, takes as its subject matter the structure of the universe, ranging from the relatively nearby objects of the solar system to the remote galaxies of outer space. Astronomy is developing rapidly due to renewed interest generated by the advent of the Space Age. Many areas of current astronomical research, such as pulsars, were not even known as little as ten years ago.

Requirements for a major in astronomy are arranged to provide the student with a good background in the related fields of mathematics and physics and to include the fundamentals of astronomy and astrophysics. This course of study is intended to prepare the student for either graduate work in astronomy or astronomy-related employment in a research facility or laboratory.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs algebra and trigonometry. It is also recommended that the high school preparation include advanced algebra and solid geometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements listed earlier in the catalog, astronomy majors are to take the same mathematics and physics courses during their first two years as physics majors. Fifty-five credits in physics and astronomy courses are required for the Bachelor of Arts degree with a major in astronomy, including Astronomy 131-132, 351, 352, 362, 363-364-365, and additional astronomy courses of the student's choice (excluding Astronomy 450, Special Problems in Astronomy, and Physics 221-222-223 plus one of the following courses: Physics 314-315-316, 322-323-324, 371-372-373, 446-447-448, or 483-485-486).

Students intending to go on to graduate study in astronomy are strongly urged to take as many of the following courses as possible: Physics 314-315-316, 322-323-324, 371-372-373, 446-447-448, 452-453-454, and 473; Astronomy 464, 465.

FOR UNDERGRADUATES

131-132 ELEMENTARY ASTRONOMY 3 (2-2) prereq high school algebra and trigonometry. The solar system, normal and variable stars, star clusters, nebulae, and galaxies.

351-362 SOLAR SYSTEM ASTRONOMY AND ASTROPHYSICS 3 (3-4) Astronomy 131-132, Physics 221-222-223, Masses, shapes, albedos, surface temperatures, composition, atmosphere, and interiors of the planets and satellites. Properties of asteroids, comets, and meteoroids.

360-361 CELESTIAL MECHANICS AND DETERMINATION OF ORBITS 3 (3-0) prereq Astronomy 131-132, Math 251-252-253, Physics 221-222-223 and 301. Celestial mechanics; calculation of the orbits of planets, comets, and asteroids; applications to earth satellites and interplanetary space missions.

362 OBSERVATIONAL ASTRONOMY 3 (3-0) prereq Astronomy 131-132, Physics 221-222-223. Telescopes and instrumentation for the determination of the positions, brightness, colors, and other properties of stars; particular attention to photoelectric photometry. Includes observational and computational problems.

363-364-365 STELLAR ASTRONOMY AND ASTROPHYSICS 3 (3-0) prereq Astronomy 131-132, Math 251-252-253, Physics 221-222-223. Stellar structure and evolution; applications of physical laws to determine the nature of the stars; analysis of stellar spectra: structure of stars and their evolution; galactic structure and cosmology. Includes observational and computational problems.

450 SPECIAL PROBLEMS IN ASTRONOMY V 1-3 prereq 15 credits of astronomy and c/l. Research or directed reading in selected areas of astronomy or astrophysics.

454 STELLAR ATMOSPHERES 3 (3-0) prereq Math 251-252-253, Astronomy 221-222-223. Radiative transfer theory, gray and non-gray atmospheres, line formation, curves of growth, and model atmosphere computation.

455 STELLAR INTERIORS 3 (3-0) prereq Math 251-252-253, Astronomy 221-222-223. Equations of state, review of stellar opacities and nuclear reaction rates, structure of main sequence and giant stars, theoretical Hertzsprung-Russell diagrams, age determination of star clusters.
BIOLOGY

deals with living things. This program provides basic education in the biological sciences. It is intended for students who wish to work in the broad area of biology, rather than in one of the specific fields. Two options are provided in this program; Option A for students interested in concentration in the cellular and physiological aspects of biology, and Option B, where environmental biology is emphasized. Both options are designed for those who plan to do further work at the graduate level or in one of the medical sciences. The biology program is also well suited for those who plan to teach biology at the secondary level.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs chemistry, 3½ years of mathematics. It is also recommended that the high school preparation include a modern foreign language.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN BIOLOGY

Option A (Biology): In addition to the general requirements listed earlier in the catalog, the following special requirements must be completed for a Bachelor of Arts Degree with a major in Biology: 85 or more credits in biology including Botany 111 (Introduction to Botany); Botany 114, 115 (General Botany); Microbiology 200 (General Microbiology); Zoology 112, 113 (General Zoology-Botany 330 (Cellular Physiology); Zoology-Botany 485 (Genetics) and 10 additional credits in 300 and 400 level courses in biological sciences (Recommended: Botany 250, 227, Microbiology 494; Zoology 331). Chemistry 370, 481 also recommended.

The following courses in allied sciences must be completed by students electing option A: Chemistry 121, 122, 123 (College and Organic Chemistry), Physics 111, 112, 113 (General Physics); or Physics 211, 222, 233 (General Physics); Math 116 (College Algebra), Math 117 (Trigonometry), and Math 118 (Introduction to Calculus).

Option B (Environmental Biology): In addition to the general requirements listed earlier in the catalog, the following special requirements must be completed for a Bachelor of Arts Degree with a major in Biology (Environmental Option): 65 or more credits in Biology including Botany-Zoology 111 (Introduction to Biology): Botany 114, 115 (General Botany); Zoology 112, 113 (General Zoology); Botany-Zoology 250, 251 (Concepts of Ecology); Zoology 410 (Advanced Animal Ecology), or Zoology 428 (Invertebrate Ecology); Botany 355 (Plant Ecology); Zoology-Botany 485 (Genetics), and 10 additional credits in 300 and 400 level courses in biological sciences (Recommended: Zoology 307 (Aquatic Biology); Zoology 465 (Animal Behavior); Zoology 410 (Advanced Animal Ecology), or Zoology 428 (Invertebrate Ecology); Zoology 461 (Limnology); Microbiology 200 (General Microbiology); Botany 265 (Local Flora); Botany 365 (Systematic Botany); Botany 370 (Forest Pathology); Botany 325 (Plant Physiology); Botany 411 (Physiology).

The following courses in allied sciences must be completed by students electing the Environmental Biology option: Chemistry 101, 102, 160 or Chemistry 121, 122, 123; Physics 111 and 112 or 113; Math 116, 117, 118 and 125. Recommended electives are: (1) Chemistry 100, 101, 102, 160; (2) Mathematics 111, 112, 113; (3) Zoology 100, 110, 111, 112, 113, 114; (4) Geography 101 (Physical Geography); Geography 390 (Climatology); Geography 413 (Population and Resource Geography); Computer Science 210 (Fortran); Zoology 325 (Systematic Botany); Botany 100 (Forest Solis); Botany 370 (Wildlife Conservation).

The foreign language requirement listed earlier in the catalog must be satisfied by those in both biology options. English 100 and 150 are also required.

Suggested first year program for Options A and B:

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<td>Chem 101, 102, 160</td>
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<td>4</td>
<td>4</td>
</tr>
<tr>
<td>or Chem 121-122-123</td>
<td>(5)</td>
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<tr>
<td>HPER 120</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Electives or Group Requirements</td>
<td>0-2</td>
<td>0-2</td>
<td>0-2</td>
</tr>
<tr>
<td>15-18</td>
<td>15-18</td>
<td>15-18</td>
<td></td>
</tr>
</tbody>
</table>

FOR UNDERGRADUATES

FOR explanation see Course Descriptions (Index)

100 FIELD BOTANY 3 (0-6)

111 INTRODUCTION TO BIOLOGY 3 (3-4)

114 (113) GENERAL BOTANY 5 (3-4) prereq 111 or = The morphology, reproduction and evolutionary relationships of the various plant groups.

115 (112) GENERAL Botany 5 (3-4) prereq 114 or = The anatomy, physiology and ecology of higher plants.

170 SURVEY OF WILDLIFE CAREERS 1 (1-0).

170A STRATEGIC PLANNING FOR WILDLIFE 1 (1-0).
256. BASIC CONCEPTS OF ECOLOGY 3 (3-0) prereq one year of college biology. Ecological principles with emphasis on the ecosystem. (Credit not allowed for this course and Zool. 250.)

251. ELEMENTARY ECOLOGY LABORATORY 2 (0-4) prereq or concurrent enrollment. Introduction to ecological methods and field techniques. (Credit not allowed for this course and Zool. 251.)

262 (123) LOCAL FLORA 4 (2-6) prereq 114. The identification of flowering plants.

FOR UNDERGRADUATES AND GRADUATES

325 (125) PLANT PHYSIOLOGY 5 (3-4) prereq 115 and Chem 160 or 123. The chemical and physical basis of metabolism, photo-synthesis, nutrition, water relations, and growth of plants. (Credit not allowed for this course and Zool. 467.)

339. CELLULAR PHYSIOLOGY (see Zoology)

334. MICROTECHNIQUE 3 (1-4) prereq 15 cr. in Botany. Techniques of preparing cellular, tissue sections, and collections of algae and fungi for study. Use of microscopes.

355. PRINCIPLES OF PLANT ECOLOGY 5 (1-8) prereq 250, 251 and 255. Field and laboratory analysis of methods used in the description and interpretation of plant and environmental interrelationships.

365. SYSTEMATIC BOTANY 5 (2-8) prereq 151 or =. Identification, principles of classification, phylogeny, methods of collecting and preserving of vascular plants. (Credit not allowed for this course and Zool. 467.)

366. AGROSTOLOGY 5 (2-4) prereq 256 or =. Identification, classification, and ecological relationships of grasses, sedges, and rushes. (Given for 3 cr. at the Biological Station.)

368. AQUATIC FLOWERING PLANTS 3 (0-7) prereq 256 or =. Identification, classification and ecological distribution of the higher aquatic plants.

370. FOREST PATHOLOGY 4 (2-4) prereq 250 or 355, and For 290-291. The agencies of disease and decay of trees and structural timbers.

390. CHEMISTRY OF PLANT CONSTITUENTS (See Chem 390 and For. 390).

403. BIOLOGICAL ILLUSTRATIONS 2 (0-4) prereq 1 year of biology and c/i. Basic principles and skills of producing illustrative material. Preparation of biological and textual supplies fee. (Credit not allowed for this course and Zool 463.)

421. MINERAL NUTRITION 5 (3-4) e/y prereq 325. The absorption, translocation and utilization of minerals by plants; mineral requirements of plants, plant tissue analysis and the culture of plants under controlled nutrient regimes.

423 (325) RESPIRATORY METABOLISM IN PLANTS 5 (3-4) o/y prereq 325, Chem 390 and Phys 115 or =. The respiratory mechanism in plants, relationships of respiration to other processes in the plant, photosynthesis, nitrogen metabolism.

427. PLANT VIRUSES 4 (2-4) prereq 151 or =. Micro 420, Plant Pathology and the diseases which cause the disease. The isolation, purification, identification, and host ranges of selected plant viruses.

428. ALGAL PHYSIOLOGY 5 (3-4) prereq 325, 441 or c/i. Comparative macro- and ultrastructure, physiology, biochemistry, and ecology of the photobiont algae with special emphasis on the alga and their relationships to both the bacteria and higher plants.

429 (329) PROBLEMS IN PLANT PHYSIOLOGY V 1-6 (0-3/6) R-6 prereq 325 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant physiology not taken up in regular courses.

432 (322) MORPHOGENESIS 5 (4-5) o/y prereq 325 or =. The effect of internal and external factors on the growth and forms of organisms.

434. ADVANCED MICROTECHNIQUE 4 (1-6) prereq 20 cr. in Botany. Technical training in techniques such as photomicrography, photography, audio-radiography, in vitro culture, etc.

435 (335) PLANT ANATOMY 5 (2-6) o/y prereq 151 or =. The origin of organs and tissues and the anatomy of vascular plants.

437 (337) CYTOLOGY 5 (3-4) e/y prereq 115 and Chem 160 or =. The finer structure of the plant cell in relation to its function.

439 (339) PROBLEMS IN PLANT ANATOMY AND CYTOLOGY 1-6 (0-3/6-6) R-6 prereq 435, 436 or 327 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant anatomy and cytology not taken up in regular courses.

441 (361) PHYSIOLOGY 5 (3-6) e/y prereq 115 or =. Morphology and anatomy and ecology of the algae, especially of the northern Rocky Mountains (given for 6 credits at the Biological Station).

442 (362) BRYOLOGY 5 (2-6) o/y prereq 115 or =. The morphology, taxonomy and ecology of the bryophytes, especially of the northern Rocky Mountains (given for 6 credits at the Biological Station).

443 (360) PTERIDOLOGY 5 (2-6) o/y prereq 115 or =. The morphology, taxonomy and ecology of the pteridophytes, especially of the northern Rocky Mountains (given for 3 credits at the Biological Station).

445 (345) SPERMATOPHYTES 5 (2-6) e/y prereq 115 or =. The morphology and life histories of the gymnosperms and angiosperms.

449 (349) PROBLEMS IN PLANT MORPHOLOGY 1-6 (0-3/6) R-6 prereq 441, 442, or 445 or 445 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant morphology not taken up in regular courses.

451. ECOLOGICAL SYSTEMS ANALYSIS 4 (3-2) prereq Mathematics I18, 125, Computer Science 201, Botany 295 or c/i. Mathematical analysis of ecological systems, mathematical models, computer simulation, optimization and systems analysis.

459 (359) PROBLEMS IN PLANT ECOLOGY 1-6 (0-3/6) R-6 prereq 250 or 355 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant ecology not taken up in regular courses.

467. PRINCIPLES OF BOTANICAL NOMENCLATURE 2 (0-2) e/y prereq c/i. Application of the rules of nomenclature to plant classification.

469 (369) PROBLEMS IN PLANT TAXONOMY 1-6 (0-3/6) R-6 prereq 365 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant taxonomy not taken up in regular courses.

475 (375) MYCOLOGY 5 (3-4) o/y prereq 115 or =. The morphology, taxonomy and ecology of the fungi, especially of the northern Rocky Mountains (given for 6 cr at the Biological Station).

479 (379) PROBLEMS IN MYCOLOGY AND FOREST PATHOLOGY 1-6 (0-3/6) R-6 prereq 375 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of mycology and plant pathology not taken up in regular courses.

483. PALEOBOTANY 5 (2-4) o/y prereq 115 or =. An introduction to the study of fossil plants.

484. PALYNOLOGY 3 (2-2) e/y prereq senior standing in a natural science and c/i. Fossil and recent pollen and spores—methods of extraction, identification and the application of palynological data in botanical and non-botanical disciplines.

485 (385) GENETICS. (See Zoology.)

498 (388) EVOLUTION 3 (3-0) prereq 265, 486; Zool 113. The nature of and processes by which evolution occurs. (Credit not allowed for this course and Zool 486.)

499. CYTOGENETICS 4 (3-2) prereq 485 or =. The structure and destiny of chromosomes from bacteria to higher organisms. Chromosome behavior and changes, their role in development and evolution. (Credit not allowed for this course and Zoology 487.)

498. PROBLEMS IN PALEOBOTANY V 1-6 (0-3 per credit) R-6 prereq 483 and c/i.

500. SENIOR SEMINAR 1 (2-0) R-4. (Credit not allowed for this course and Zool. 490.)

491-492-493 SENIOR WILDLIFE SEMINAR (See Forestry)

504. BOTANICAL LITERATURE 1 (2-0) R-2 prereq 20 credits in botany. Student reports on current botanical literature.

FOR GRADUATES

505. HISTORY AND DEVELOPMENT OF BIOLOGICAL CONCEPTS 3 (3-0) prereq Bachelor's degree. The historical development of ideas from prehistoric to modern biology as applied to the use of American Institute of Biological Sciences, Biological Sciences Curriculum Study (BSCS) Green-Version materials in teaching high school biology. Not to be allowed for a major in Botany.

523. PHOTOBIOLOGY 4 (2-4) prereq 330. The interaction between ionizing radiation and biological systems including photosynthesis, vision, photoperiodism, bioluminescence; methods for studying effects of light on plants, animals, and microorganisms. (Credit not allowed for this course and Zool. 523.)

524. RADIOBIOLOGY 4 (2-4) prereq 330. The influence of ionizing radiation (x-rays gamma rays, and accelerated particles) on biological systems and the use of radio-isotopes in biology. (Credit not allowed for this course and Zool. 524.)

551. GENERAL ECOLOGY 6 (6-15) prereq Bachelor's degree: major preparation in Botany, Biology, or Zoology. Community concept of ecosystems and the flow of energy and materials through communities. (Credit not allowed for this course and Zool. 551.)

562-563 TAXONOMY OF VASCULAR PLANTS 5 (3-4) o/y prereq c/i. Classification, distribution and evolutionary relationships of the vascular plants.

564. EXPERIMENTAL TAXONOMY 4 (2-4) e/y prereq 437, 486, 583. Modern concepts in taxonomy with emphasis on cytological, molecular, biochemical and other modern approaches to the principles of plant classification.

565 (485) PHYTOGEOGRAPHY 4 (4-0) e/y prereq 353, 486, 582, 583, Geol 101-102 or 110. Vegetation types of the world and their history in North America.
BUSINESS ADMINISTRATION

The School of Business Administration, founded in 1918, is the largest professional school of the University of Montana. It is accredited by the American Association of Collegiate Schools of Business; its curriculum, therefore, is similar to those of other recognized schools of business.

The aim of the School of Business Administration is to provide a broad foundation in the fundamentals of organizational administration and management as well as exposure to the basic principles of the specialized disciplines within the field of business administration. The complexity and scope of our contemporary society have brought about an ever increasing need for responsible leadership in the business community. A professional business education combined with a solid grounding in the liberal arts and sciences prepares young men and women to meet the challenges of an age of organizational revolution and actively to participate in the molding of the future of that age.

The curriculum of the School of Business Administration provides particular preparation in a variety of fields in addition to the basic core courses. The areas of concentration in which the student may specialize are: accounting, finance, business education, marketing, office administration, personnel or production management.

The student may elect to pursue a program of studies leading to the degree of Bachelor of Science in Business Administration or to the degree of Bachelor of Arts in Business Administration. These programs are described below.

Opportunity for further study at the graduate level is offered through two programs leading to the degrees of Master of Business Administration or Master of Science in Business Administration (with concentrations in accounting, business education, computer systems, finance, management, or marketing). The MBA program is particularly suited to those students whom have already received undergraduate education in areas other than business administration. Further details may be obtained from the Graduate Studies Bulletin or by specific inquiries directed to: Director of Graduate Studies, School of Business Administration.

PRE-BUSINESS PROGRAM

Upon entering the University as a freshman, a student who desires to major in Business Administration registers as a pre-business administration major. In the first two years of study the student completes courses toward meeting the general university requirements and prerequisite course work for courses to be taken subsequently in the School of Business Administration. Students who plan to major in Accounting are advised to take Business Administration 201, 202, and 203 in their freshman year.

The general university and pre-business administration requirements include: Health, Physical Education and Recreation 106 (3 quarters, 3 credits), English 100 and 300 (except that students receiving an "A" or "B" grade in English 100 may substitute for English 300 any literature course other than English 101), requirements from Group I; requirements from Group II including Mathematics 116; requirements from Group III including Economics 201-202-203; requirements from Group IV and English 100 and 300; Business Administration 201-202 and 250; Pre-business requirements are prerequisites for all business administration courses numbered 300 and above except that Accounting Majors may take Business Administration 304, 307, and 308 in their sophomore year.

ADMISSION AND GRADING REQUIREMENTS

Admission to the School of Business Administration requires junior standing, completion of the pre-business requirements, and a minimum of a "C" average on all credits attempted. To continue work toward the bachelor of business administration the student must maintain at least a "C" average in all course work in Business Administration and for course work in the area of concentration selected.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

To achieve the degree of Bachelor of Science in Business Administration, the student must:

a. Complete the general university and pre-business administration requirements.

b. Complete core courses: Economics 301, Bus Ad 322, 340, 342, 350, 357-358, 360, 370, and 446. Core courses may not be taken for graduate credit by Bus. Ad. majors. Non-business majors may arrange to earn graduate credit for core courses.

c. Select before the beginning of the third quarter of the junior year an area of concentration from the following: Accounting, Business Education, Finance—Option A, B or C, General Business, Management—Option A or Option B, Marketing.

This selection of an area of concentration is to be indicated by completing a prescribed form available in the office of the Dean of School of Business Administration and by filing the completed form in that office.

d. Complete the course work required in the selected area of concentration as indicated by the appropriate curriculum of the area of concentration below.

e. Offer not less than a total of 75 credits in courses in the School of Business Administration. Courses outside the School of Business Administration which may count toward the 75 credit requirement are: all courses offered by the Department of Economics except 101; English 450, History 474.

f. Present not less than 90 credits (exclusive of Health and Physical Education) of work taken in departments and schools other than the School of Business Administration.

g. Offer at least 195 credits including 3 credits in Health and Physical Education.

h. Attain an average grade of "C" on all credits in business administration courses for which a grade is received and on all credits in the area of concentration selected for which a grade is received.

CURRICULA OF THE AREAS OF CONCENTRATION

ACCOUNTING

Students specializing in accounting must complete the following requirements in addition to the basic requirements of the School of Business Administration:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 203</td>
<td>Accounting Principles III</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 203-204-205</td>
<td>Cost Accounting I and II</td>
<td>8</td>
</tr>
<tr>
<td>Bus. Ad. 308</td>
<td>Special Problems in Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 401-402</td>
<td>Income Tax I and II</td>
<td>5</td>
</tr>
<tr>
<td>Bus. Ad. 410</td>
<td>C.P.A. Review</td>
<td>5</td>
</tr>
</tbody>
</table>

It is recommended that students preparing for the public accounting profession take the following additional courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 305</td>
<td>Governmental Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 359</td>
<td>C.P.A. Law Review</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 403-404-405</td>
<td>Accounting I and II</td>
<td>6</td>
</tr>
<tr>
<td>Bus. Ad. 410</td>
<td>Consolidated Statements</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 410-412</td>
<td>C.P.A. Review</td>
<td>7</td>
</tr>
</tbody>
</table>

BUSINESS EDUCATION

In addition to the basic requirements of the School of Business Administration, students concentrating in Business Education must include the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 191-192-193</td>
<td>Production Typewriting</td>
<td>5</td>
</tr>
<tr>
<td>Bus. Ad. 184-185-186</td>
<td>Stenography</td>
<td>15</td>
</tr>
<tr>
<td>Bus. Ad. 192</td>
<td>Methods of Teaching Secretarial Practice</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Ad. 192-193</td>
<td>Office Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 302-304</td>
<td>Methods of Teaching Typewriting</td>
<td>5</td>
</tr>
<tr>
<td>Bus. Ad. 305-306</td>
<td>Methods of Teaching Shorthand and Transcription</td>
<td>2</td>
</tr>
</tbody>
</table>
FINANCE

Three optional areas of concentration are offered in the field of Finance:

Option A. Financial Management

The financial management curriculum is designed to give students an understanding of the financial markets and their relation to banking and investments as well as to acquaint students with the concepts and methods relevant to financial analysis and management.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 242 - Business Banking</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 241 - Theory of Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 240 - Principles of Insurance and Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 420 - Investments</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 422 - Problems in Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 429 - Analysis in Finance</td>
<td>3</td>
</tr>
<tr>
<td>Econ 311 - Intermediate Econ. Analysis</td>
<td>4</td>
</tr>
<tr>
<td>*Bus. Ad. 447 - Managerial Economics</td>
<td>4</td>
</tr>
</tbody>
</table>

*Students are advised to take Econ 311 before BA 347.

Option B. Insurance

This curriculum provides the student with a basic understanding of risk and uncertainty prerequisites for the risk manager, with special attention to the concepts and techniques of the insurance profession.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 320 - Principles of Insurance and Risk Management</td>
<td>cr.</td>
</tr>
<tr>
<td>Bus. Ad. 326 - Life and Health Insurance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 327 - Property and Casualty Insurance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 328 - Real Estate Law</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 329 - Management of Financial Institutions</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 411-412 - Income Tax and II</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 425 - Social Insurance</td>
<td>3</td>
</tr>
</tbody>
</table>

Option C. Real Estate

The course of instruction offered in the field of Real Estate is intended to equip the student with the necessary training to handle the managerial, financial, and procurement problems incident to land and its usage.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 234 - Real Estate Law</td>
<td>cr.</td>
</tr>
<tr>
<td>Bus. Ad. 246 - Money and Capital Markets</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 245 - Real Estate Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 246 - Property Valuation Theory</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 247 - Property Management</td>
<td>3</td>
</tr>
<tr>
<td>Econ 335 - Land Economics</td>
<td>3</td>
</tr>
<tr>
<td>Soc. 301-304-305 - Seminar in Urban Studies (anyone of the three)</td>
<td>3</td>
</tr>
</tbody>
</table>

ACCOUNTING

This curriculum is designed to equip the student with analytical, interpretive, and creative skills to enable him to assume a managerial role in a wide variety of production, marketing, finance, and government organizations. In addition to the basic requirements of the School of Business Administration, students concentrating in management must include the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 301 - Administrative Accounting and one additional course</td>
<td>cr.</td>
</tr>
<tr>
<td>or BA 302 - Accounting</td>
<td>4-6</td>
</tr>
<tr>
<td>or BA 382 - Analysis of Consumer Behavior</td>
<td>3</td>
</tr>
<tr>
<td>or BA 383 - Analysis of Marketing Communication</td>
<td>4</td>
</tr>
<tr>
<td>or BA 411 - Personnel Administration</td>
<td>4</td>
</tr>
<tr>
<td>or BA 417 - Managerial Economics</td>
<td>4</td>
</tr>
</tbody>
</table>

MANAGEMENT

The student would also select at least 9 hours from one of the following groups, and at least one course from each of the other groups:

A. Personnel and Industrial Administration

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 442 - Personnel Management</td>
<td>4</td>
</tr>
<tr>
<td>BA 444 - Regulation of Industry</td>
<td>4</td>
</tr>
<tr>
<td>Econ 211-22 - Labor Economics</td>
<td>6</td>
</tr>
<tr>
<td>Eng 460 - Industrial Relations</td>
<td>3</td>
</tr>
<tr>
<td>Engl 460 - Problems in Composition</td>
<td>3</td>
</tr>
<tr>
<td>Psych 342 - Personnel Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Psych 343 - Industrial Psychology</td>
<td>5</td>
</tr>
</tbody>
</table>

B. Marketing

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 362 - Analysis of Consumer Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BA 363 - Analysis of Marketing Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 366 - Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>BA 444 - Regulation of Industry</td>
<td>3</td>
</tr>
<tr>
<td>BA 460-461 - Marketing Management</td>
<td>6</td>
</tr>
<tr>
<td>Engl 450 - Problems in Composition</td>
<td>3</td>
</tr>
</tbody>
</table>
446 ADMINISTRATION AND BUSINESS POLICIES 4 prereq 340, 360, and Econ 301. (May be taken in one of last two quarters before graduation.) Top-management oriented to develop an integrated view of the organization and its environment. Functional analytic techniques involved in problem solving and in coordination.

447 (347) MANAGERIAL ECONOMICS 4 prereq 340. The application of economic analysis to the operation of a business. Demand and cost analysis, competitive and non-competitive pricing, and multi-line production and marketing problems.

449 MANAGEMENT SEMINAR V R-6. Selected projects for developing analytical tools used in general management in the decision-making process.

450 QUANTITATIVE PROBLEMS ANALYSIS V R-4 prereq 350 or = or c/1. Practice in the application of selected quantitative techniques to business problems. Topics and projects selected in consultation with the instructor.

470 ANALYSIS AND DESIGN OF BUSINESS SYSTEMS 3 prereq 350, 370, and CS 301 or =. Techniques for the analysis and design of business data processing and information systems utilizing the computer. Flow-charting, data-accounting tables, data matrices, theoretical and practical problems encountered in defining business systems and judging the feasibility of computer processing.

475 COMPUTER SIMULATION OF BUSINESS SYSTEMS 3 prereq 350 or = and CS 301 or =. Modeling business information and control systems for simulation on electronic computers. Application of inventory control, planning, forecasting and budgeting.

499 SEMINAR V R-4.

FOR GRADUATES

540 INDUSTRIAL HUMAN RELATIONS 4. Analysis of management of people in the firm and relations of consumer to the firm through use of behavioral models drawn from contemporary psychology and social psychology.

545 RESEARCH METHODS 2. Sources of data, governmental and non-governmental; quality of data, problems of use and interpretation problem formulation, research organization and planning; case studies and evaluation of selected research reports.

543 MANAGEMENT OF ENTERPRISE 3. Management as an art and science. Descriptive and analytical explanations of management practices and processes emphasizing functions of: planning, organizing, staffing, controlling, directing, measuring, appraising, coordinating, communicating, decision making, and determining objectives, policies, and procedures. An integrative approach to diagnosing situations, processing information for decision making, and incorporating current interdisciplinary research techniques in understanding human behavior.

550 STATISTICAL METHODS 4 prereq Math 116 or =. The origin, processing, use and interpretation of accounting and statistical data by business firms; problems and methods of analysis associated with the quantitative approach to decision making in business; specific topics covered include elements of probability, simple regression analysis, sampling, time series, index numbers, graphical presentation and modern data processing.

557 LEGAL ENVIRONMENT 3. Includes classification of the law, the judicial process, the attorney-client relationship, available resources and elements of the government administrative regulation, and regulatory legislation.

561 BUSINESS HISTORY 3. Literature from the colonial period to present, emphasizing methodology and techniques of economic interpretation as an aspect of business history. (Credit not allowed for both Bus Ad 561 and Hist 561.)

599 RESEARCH V R-6. Special research problems.

646 ADVANCED MANAGEMENT PROBLEMS 3. Interdisciplinary approach to the analysis of problems encountered by senior business administrators: determination of objectives; development of policies to achieve objectives; organization of executive personnel to implement policies; coordination of the organization; appraisal and adjustments of the organization to changes in environment.

647 MANAGERIAL ECONOMICS 3. The use of various analytical tools in the decision-making process of business managers: discussion of selected problem-solving techniques (e.g., mathematical programming, data analysis, decision-making, statistical methods) with application to dynamic real-world situations.

650 QUANTITATIVE ANALYSIS 4. Application of subjective probability and modern utility theory to business problems arising out of risk and uncertainty. Application of selected techniques such as mathematical programming, queuing theory, game theory, simulation and others.

650 BUSINESS AND ITS ENVIRONMENT 3. Institutional and cultural factors, both domestic and foreign, which influence industrial leaders in their enterprise and community relations roles. The economic, social, and political significance of the international population growth, economic-geographic influences, and technological development. Analysis of education’s relationship to scientific progress, economics, political development, innovation and the socio-managerial implications of automation.

685 INTERNATIONAL ASPECTS OF BUSINESS 3. Trends and contemporary problems in international operations management, business relations and services, economic policies, and related subjects. The significance and effect on foreign operations of different institutions and political, social, and economic conditions.

690-692 GRADUATE SEMINAR 3. Enter any quarter. Selected topics. May be conducted as a formal seminar, or may consist of individual programs of study in the field under the guidance of the instructor.

697 PROFESSIONAL PAPER V R-5. A professional paper written in the area of the student’s major interest based on either primary or secondary research. Subject matter must be approved by graduate advisor.

699 THESIS V R-9.

MARKETING

FOR UNDERGRADUATES AND GRADUATES

300 MARKETING 3. prereq all pre-business requirements. Principles, policies, channels of distribution, merchandising, marketing institutions, marketing functions, pricing, government regulation.

301 INDUSTRIAL MARKETING 4 prereq 360. Economic factors affecting marketing policy are analyzed. Deals with buying practices, channels, advertising, industrial distributors, price, markets, and research policies.

302 ANALYSIS OF CONSUMER BEHAVIOR 3 prereq 360. Selected conceptualizations in Social Psychology are studied. Application to current business is emphasized through controlled observation and analysis by students.

303 ANALYSIS OF MARKETING COMMUNICATION 3 prereq 360. The broad area of marketing communications is analyzed. Deals with mass media communication and interpersonal communication as they relate to the total marketing process.

306 (466) MARKETING RESEARCH 3 prereq 360. Research techniques and methods including statistical analysis, quantitative experimentation, and simulation. Survey of current research practices in marketing and participation in class field project.

308 INTERNATIONAL MARKETING 4 prereq 360 (prereq waive for students majoring in Political Science). Theories, principles and methods of international trade.

400 MARKETING MANAGEMENT I 3 prereq 362, 363. Planning, coordination, and control functions in marketing management.

401 MARKETING MANAGEMENT II 3 prereq 362, 363. Individual and class analysis of case studies in marketing management.

402 PRICING POLICIES AND PRACTICES 4 prereq 360. The roles of pricing strategy and competition in marketing decision making. Administrative marketing problems related to elasticity of demand, demand curves, marginal analysis and competitive pricing. Marketing policies and strategies as they relate to competition.

408 MARKET ANALYSIS AND PLANNING 3 prereq 466. Utilization of statistical and accounting techniques in analyzing past and planning future marketing performance.

499 SEMINAR V R-4.

FOR GRADUATES

502 MARKETING MANAGEMENT 3. The business activities involved in the marketing of goods and services; the techniques, problems and policies of marketing management. Marketing institutions, functions, costs, and regulations. Students are apprised with special emphasis on the decision-making processes.

558 COMMUNICATION PRACTICES 2. Spoken communication in the organizational setting; theories, principles and techniques of mass media communication and small-group interaction, with emphasis on the latter area.

599 RESEARCH V R-6. Special research problems.

690-692 GRADUATE SEMINAR 3. Enter any quarter. Selected topics. May be conducted as a formal seminar, or may consist of individual programs of study in the field under the guidance of the instructor.

697 PROFESSIONAL PAPER V R-5. A professional paper written in the area of the student’s major interest based on either primary or secondary research. Subject matter must be approved by graduate advisor.

699 THESIS V R-9.

BUSINESS EDUCATION AND OFFICE ADMINISTRATION

Not more than 19 credits earned in Business Administration 180-181-182, 183, 184-185-186, 187-188-189, and 190-191 may be applied toward graduation by students not majoring in Business Administration or earning a teaching major or minor in Business Administration. To register for any course in stenography or secretarial practice a student must have passed the English entrance examination. Stenography, shorthand and typewriting students may be granted credit in the second term of each quarter.

504 ENTERING TYPEWRITING 2 Development of basic skills. With 2 or more credits earned, subject to approval of the instructor.

510 BEGINNING TYPEWRITING 2 Development of basic skills. With 2 or more credits earned, subject to approval of the instructor.

511 INTERMEDIATE TYPEWRITING 2 prereq 180 or equivalent. Development of basic skills. With 2 or more credits earned, subject to approval of the instructor.

512 ADVANCED TYPEWRITING 2 prereq 181 or equivalent. Development of basic skills and job application.
CHEMISTRY is the science which involves the study of atoms and molecules—their structures, their combinations, their interactions, and the energy changes accompanying their interactions.

The Department of Chemistry offers Bachelor of Science and Bachelor of Arts Degrees. The requirements for the B.S. Degree meet the latest standards of the American Chemical Society for professional education in chemistry and these graduates are certified to the American Chemical Society as meeting these standards. Chemistry majors will generally choose the B.S. degree; the B.A. in Chemistry is designed to allow latitude for an interdisciplinary program. The M.S. S. for Teachers of Chemistry, and Ph.D. degrees are also offered (see Graduate School Bulletin).

For Bachelor degree programs in the teaching of chemistry see catalog under Education.

A departmental honors program has been established for chemistry majors who attain a high scholastic record. This program is based upon independent study and research under the direction of individual faculty members. Students may apply for this program by the end of their sophomore year. In many cases financial support is available on a part-time research assistantship basis from research grants obtained by individual faculty members.

Prospective students desiring further information should write the Chairman, Chemistry Department.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, it is desirable that the student have taken two years of algebra, geometry, trigonometry, science courses and a foreign language.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN CHEMISTRY. In addition to the general requirements for graduation listed earlier in the catalog the following special requirements must be completed for the Bachelor of Science degree with a major in Chemistry: a total of 182 credits including the following requirement, 70 Chemistry credits including Chem 121-122-123, 245, 285-286-287, 341-342-343, 445, 452, 453, 474, and 6 credits selected from Chem 450, 464, 466, 468, 490, or with the consent of the department, from graduate courses in Chemistry. Geol 427, Geol 428, Geol 445, Geol 529, and advanced courses in Mathematics or Physics. Two or three of these credits must be chosen from Chem 466, 468, and 540; the rest of the six must be selected from the other courses listed. At the time of graduation a major in Chemistry must have acquired a reading knowledge of German or five quarters of German. College Physics and Mathematics through 251, and Mathematics 252 or 253, are required. Every student, unless he is in the Pre-Med Option, is required to pass a senior comprehensive examination in Chemistry. The requirements for the Bachelor of Arts degree with a Major in Chemistry are the same as for the B.S. degree except for the deletion of Chemistry 474, 6 credits of advanced Chemistry, Chem 450 and Mathematics 252 or 253. For the B.A. degree, advanced mathematics and/or advanced physics courses may be substituted for Chem 431, 452 and 466 with the consent of the department. See also the curriculum with the following options: English 100 and 300 are required. Students competent in composition may be exempt from English 100.

CHEMISTRY CURRICULUM FOR THE B.S. DEGREE

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Chem 121-122-123</td>
<td>5</td>
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<tr>
<td>Math 121-122-123</td>
<td>5</td>
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<tr>
<td>English 100</td>
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<td>Electives</td>
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<tr>
<td>Phys. Ed. 100</td>
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(Beginning Math course actually dependent on placement test.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Chem 265-266-267</td>
<td>5</td>
</tr>
<tr>
<td>Math 153, 251</td>
<td>5</td>
</tr>
<tr>
<td>Physics 211-222-223</td>
<td>5</td>
</tr>
<tr>
<td>Chem 245</td>
<td>5</td>
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<td>Electives</td>
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(Sophomore Year)

**Junior Year**

<table>
<thead>
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<tr>
<td>Math 253 (or 252)</td>
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<tr>
<td>Chem 371-372-373</td>
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<tr>
<td>Math 234-235</td>
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<td>Chem 431-432-433</td>
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<tr>
<td>German 101-102-103</td>
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<td>Electives (to include Engl 300)</td>
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</table>

(Can defer Physics 223 to spring quarter Junior year and replace by 2 cr. elective.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Chem 121-122-123</td>
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<tr>
<td>Math 153, 251</td>
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</tr>
<tr>
<td>Physics 211-222-223</td>
<td>5</td>
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<tr>
<td>Chem 245</td>
<td>5</td>
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<td>Electives</td>
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(Beginning Math course actually dependent on placement test.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Chem 265-266-267</td>
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<tr>
<td>Math 153, 251</td>
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<tr>
<td>Physics 211-222-223</td>
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<tr>
<td>Chem 245</td>
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### CHEMISTRY CURRICULUM FOR THE B.A. DEGREE

**Pre-Medical Option**

<table>
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<th>Course Section</th>
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<tr>
<td>General Chemistry 4</td>
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<tr>
<td>Math 121</td>
<td>5</td>
</tr>
<tr>
<td>English 100</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>2-3</td>
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</table>

*(Beginning Math course actually dependent on placement test.)*

### Electives (must include 6 cr. of Advanced Chemistry)

<table>
<thead>
<tr>
<th>Course Section</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem. 452</td>
<td>5</td>
</tr>
<tr>
<td>Chem. 446</td>
<td>5</td>
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<tr>
<td>Chem. 474</td>
<td>3</td>
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</table>

*(Recommended electives other than Group I (3 cr.) III and IV requirements and other Chemistry include further Mathematics, Physics, advanced Geology and French or Russian.)*

### Electives

<table>
<thead>
<tr>
<th>Course Section</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Biochemistry Laboratory 1</td>
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</tr>
<tr>
<td>Biochemistry Laboratory 2</td>
<td>3-4</td>
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<tr>
<td>Biochemistry Laboratory 3</td>
<td>3-4</td>
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</table>

*(For explanation see Course Descriptions Index)*

### FOR UNDERGRADUATES

<table>
<thead>
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<th>Course Section</th>
<th>Hours</th>
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<tr>
<td>101-102 GENERAL CHEMISTRY</td>
<td>4 (5-5)</td>
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<tr>
<td>121-122-123 COLLEGE CHEMISTRY</td>
<td>5 (5-4)</td>
</tr>
<tr>
<td>261-262-263 ORGANIC CHEMISTRY</td>
<td>4 (4-4)</td>
</tr>
<tr>
<td>265-266-267 INORGANIC CHEMISTRY</td>
<td>4 (4-4)</td>
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*(Recommended for freshmen only.)*

<table>
<thead>
<tr>
<th>Course Section</th>
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<tbody>
<tr>
<td>Chemistry Laboratory 1</td>
<td>3 (2-1)</td>
</tr>
<tr>
<td>Chemistry Laboratory 2</td>
<td>3 (2-1)</td>
</tr>
<tr>
<td>Chemistry Laboratory 3</td>
<td>3 (2-1)</td>
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*(Required for all chemistry majors.)*

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<th>Course Section</th>
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<tr>
<td>Chemistry Laboratory 4</td>
<td>3 (2-1)</td>
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<tr>
<td>Chemistry Laboratory 5</td>
<td>3 (2-1)</td>
</tr>
<tr>
<td>Chemistry Laboratory 6</td>
<td>3 (2-1)</td>
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*(Recommended for seniors only.)*

<table>
<thead>
<tr>
<th>Course Section</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chemistry Laboratory 7</td>
<td>3 (2-1)</td>
</tr>
<tr>
<td>Chemistry Laboratory 8</td>
<td>3 (2-1)</td>
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*(Required for seniors only.)*
803 METABOLIC REGULATION 3 (3-0) prereq 482. Control and regulatory mechanisms of metabolism with particular emphasis on factors that modulate the activity of enzymes, such as feedback inhibition and genetic expression. Interplay and control of metabolic pathways.

630 SEMINAR 1 R.

550 INORGANIC CHEMISTRY SEMINAR 1 R (1-0) prereq graduate standing in Chemistry.

641 SPECIAL TOPICS IN INORGANIC CHEMISTRY 3 (3-0) prereq 373 and 452. Topic specified in class schedule.

645 CHEMISTRY OF THE TRANSITION ELEMENTS 3 (3-0) prereq 452.

655-656 PHYSICAL INORGANIC CHEMISTRY 3 (3-0) prereq 482.

660 ORGANIC CHEMISTRY SEMINAR 1 R (1-0) prereq graduate standing in Chemistry.

661 ADVANCED ORGANIC CHEMISTRY 3 (3-0) prereq 263 or 267.

662-663 MECHANISMS AND STRUCTURE 3 (3-0) prereq 661.

664-665 PHYSICAL ORGANIC CHEMISTRY 3 (3-0) prereq 373, and 664 or 662.

666 STEROCHEMISTRY 3 (3-0) prereq 663.

668 SPECIAL TOPICS IN ORGANIC CHEMISTRY 3 (3-0) R prereq 661. Topic specified in class schedule.

670 PHYSICAL CHEMISTRY SEMINAR 1 R (1-0) prereq graduate standing in Chemistry.

671 KINETICS 3 (3-0) prereq 373.

672 QUANTUM CHEMISTRY I 3 (3-0) prereq 373.

673 THERMODYNAMICS 3 (3-0) prereq 373.

674 QUANTUM CHEMISTRY II 3 (3-0) prereq 672.

675 STATISTICAL THERMODYNAMICS 3 (3-0) prereq c/l.

676 MOLECULAR STRUCTURE 3 (3-0) prereq c/l.

680-697 ADVANCED MOLECULAR BIOLOGY LABORATORY V 1-3 (0-6 to 9) prereq c/l. Modern research techniques employed in the life sciences. (Cross-listed with Bot, Mich, Pharm, Zool.)

690 RESEARCH V.

699 THESIS V R-15.

212 COBOL PROGRAMMING AND DATA PROCESSING 2 prereq Math 301, CS 101 or concurrent registration or c/l. Primarily for students in business. Computer programs will be developed using the COBOL language. (Credit not allowed for both CS 212 and BA 371.)

220 INTRODUCTION TO DISCRETE STRUCTURES 3 prereq 200. The algebra of sets and algebraic structures including sets, groups and groups as well as the theory of graphs. Applications of these structures to computer science.

271-272-273 COMPUTING AND MATHEMATICS 3 (3-4) prereq Math 301 and c/l. (A digital computer is used.) (271) Linear equations and inequalities, linear programming, (272) Intuitive calculus. (273) Logic and probability theory. (Credit not allowed for this course and Math 271-272-273.)

299 SEMINAR V R-6 c/l.

FOR UNDERGRADUATES AND GRADUATES

511 COMPUTING AND DATA PROCESSING 1 prereq 471 or c/l. Introduction to the basic concepts of electronic data processing with emphasis on the operational mechanisms of the computer and the systems of control and organization designed to manage the processing of data.

512 COMPUTER PROGRAMMING 2 prereq Math 301, CS 101 or concurrent registration or c/l. The FORTRAN programming language. Basic coding techniques, formulation of problems. Computer programs will be developed by students in simulated applications.

582 COMPUTER SCIENCE-25

583 COMPUTER SCIENCE-26

584 ARTIFICIAL INTELLIGENCE V R-4 prereq CS 473 or Math 472. Problems in expert systems, heuristics and algorithms and their implementation by computers.

585 ARTIFICIAL INTELLIGENCE V R-4 prereq CS 473 or Math 472. Problems in expert systems, heuristics and algorithms and their implementation by computers.

588 COMPUTER SCIENCE-28

589 COMPUTER SCIENCE-29

590 COMPUTER SCIENCE-30

591 COMPUTER SCIENCE-31

592 COMPUTER SCIENCE-32

593 COMPUTER SCIENCE-33

594 COMPUTER SCIENCE-34

595 COMPUTER SCIENCE-35

596 COMPUTER SCIENCE-36

597 COMPUTER SCIENCE-37

598 COMPUTER SCIENCE-38

599 COMPUTER SCIENCE-39

600 COMPUTER SCIENCE-40

601 FORTRAN PROGRAMMING 2 prereq Math 301, CS 101 or concurrent registration or c/l. The FORTRAN programming language. Basic coding techniques, formulation of problems. Computer programs will be developed by students in simulated applications.

602 COMPUTER METHODS OF SOLUTION OF LINEAR SYSTEMS 3 (3-4) prereq Math 353 and 356 or concurrent registration or c/l. Emphasis on the artificial intelligence. Applications to: linear and quadratic equations, approximation and interpolation, numerical solution of linear and nonlinear equations, numerical solution of ordinary and partial differential equations, numerical solution of integral equations and selected topics. Assigned work on digital computer. (Credit not allowed for this course and Math 471-472-473.)

605 COMPUTER PROGRAMMING 2 prereq Math 301, CS 101 or concurrent registration or c/l. The FORTRAN programming language. Basic coding techniques, formulation of problems. Computer programs will be developed by students in simulated applications.

606 COMPUTER PROGRAMMING 2 prereq Math 301, CS 101 or concurrent registration or c/l. The FORTRAN programming language. Basic coding techniques, formulation of problems. Computer programs will be developed by students in simulated applications.
**DENTAL HYGIENE**

The Department of Dental Hygiene offers a curriculum leading to the degree of Bachelor of Science in Dental Hygiene. The curriculum consists of two years of pre-dental hygiene courses and two years of professional work. Pre-dental hygiene courses give the student a background in biological and physical sciences in preparation for the professional training.

Under direction of the dentist and within the limits of the dental practice act under which the dental hygienist is licensed, this auxiliary provides clinical, educational and community services in dental offices, public health, schools, hospitals, industry, research, and the Armed Forces. Clinical duties of the dental hygienist include removing stains and deposits from the teeth, applying preventive agents to oral structures, exposing and processing dental X-rays, obtaining and preparing diagnostic information for interpretation by the dentist, and assisting the dentist at the chair.

**SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN DENTAL HYGIENE**

In addition to the general requirements for graduation listed earlier in the catalog (except the foreign language requirement), the following courses are required for the Bachelor of Science degree in Dental Hygiene: English 180, Mathematics 116, 125; Chemistry 101, 102, 180; Health, Physical Education and Recreation 199, 200, 295; Economics 146 or 246; Psychology 110, 230; Speech Communication 111; Pharmacy 340, 341, 301, 302, 304, 308, 309, 310, 311, 312, 400, 401, 402, 403, 404, 410, 411, 412.

The Dental Hygiene Aptitude Test must be taken during the spring quarter, Sophomore year.

The National Board Dental Hygiene Test must be taken during the spring quarter, Senior year.

A total of 195 credits including 3 credits of required Health, Physical Education and Recreation 100 course is required.

The Dental Hygiene licensure examination will be given once each year by the Montana State Board of Dental Examiners.

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### DENTAL HYGIENE CURRICULUM FOR THE B.S. DEGREE

<table>
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<tr>
<th>Freshman Year</th>
<th>Autumn</th>
<th>Winter</th>
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<tr>
<td>Lower Division Composition (Engl 100)</td>
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<tr>
<td>College Algebra (Math 119)</td>
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<td>Elementary Statistics (Math 125)</td>
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<tr>
<td>Introduction to Biology (Zool 111)</td>
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<tr>
<td>Introduction to Psychology</td>
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<td>General Zoology (Zool 113)</td>
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<td>Principles of Public Speaking (Sp Co 111)</td>
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<td>Health, Physical Education and Recreation (HPER 100)</td>
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<td>Group Requirements</td>
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<th>Sophomore Year</th>
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<tr>
<td>Human Physiology (Zool 202)</td>
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<tr>
<td>General Chemistry (Chem 101-102)</td>
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<tr>
<td>Survey of Clinic Dentistry (Chem 180)</td>
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<td>Elementary Microbiology (Micro 101-103)</td>
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<td>General Microbiology (Micro 200)</td>
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<td>Human Anatomy (HPER 290)</td>
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<tr>
<td>First Aid (HPER 199)</td>
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<td>Elementary Nutrition (Home Ec 246 or 146)</td>
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<td>Child and Adolescent Psychology (Psych 230)</td>
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<td>Group Requirements and Electives</td>
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**Junior Year (scheduled for fall 1971)**

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<td>Oral Hygiene (Home Ec 368)</td>
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<td>Dental Materials (Dent 200)</td>
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<td>Techniques of Oral Prophylaxis (DH 310)</td>
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<td>Dental Anatomy (DH 300)</td>
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<td>General and Oral Pathology (DH 302)</td>
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<td>Oral Microbiology (Micro 307)</td>
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<td>Periodontics (DH 484)</td>
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<td>Drugs and Dental Therapeutics (Pharm 341)</td>
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**Senior Year**

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<tr>
<th>Dental Ethics and Jurisprudence (DH 312)</th>
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<tr>
<td>Roentgenology (DH 400)</td>
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<td>Preventive Dentistry (DH 306)</td>
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<td>Field Practice (DH 404)</td>
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<td>Problems in Dental Hygiene (DH 411)</td>
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</tbody>
</table>

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260 DENTAL ANATOMY 3 (3-0) prereq HPER 290. The growth and development of the teeth; morphology of permanent and primary teeth and the supporting tissues; drawing and carving of casts.

301 ORAL HISTOLOGY 3 (3-0) prereq Dental Hygiene 300. Development and microscopic anatomy of structures in the oral cavity, with particular reference to the teeth.

302 GENERAL AND ORAL PATHOLOGY 3 (3-0) prereq Microbiology 100-101 or 200, 307; Home Economics 146 or 246, 366; Psychology 110, 230; Speech Communication 111; Pharmacy 340, 341, 301, 302, 304, 308, 309, 310, 311, 312, 400, 401, 402, 403, 404, 410, 411, 412.

304 PRINCIPLES OF PERIODONTOLOGY 3 (3-0). Classification, etiology, and principles of treatment of periodontal diseases and their relationship to dental hygiene practice.

305 DENTAL MATERIALS 3 (3-0) prereq Chemistry 180 (2-4). Physical and chemical properties of dental materials, with laboratory experience in their manipulation.

310 TECHNIQUES OF ORAL PROPHYLAXIS 3 (2-4). Objectives and principles of oral hygiene; instrumentation and procedure of oral prophylaxis, topical application, oral inspection, and dental health instruction, some clinical experience.

311 PRINCIPLES OF DENTAL HYGIENE PRACTICE 3 (3-0). The causes, manifestations, and effects of stains and hard deposits on teeth. Principles and methods for removal of these deposits; laboratory techniques and instrumentation on manikins. Techniques and principles of patient dental health education. Orientation to clinical procedures and patient management.

312 DENTAL HYGIENE ETHICS AND JURISPRUDENCE 2 (2-0). Fundamental ethics and professional application with reference to dental hygiene. Working arrangements and attitudes toward service to individual patients and community. Professional loyalty. Legal status of dentistry and dental hygiene.

313 SEMINAR IN DENTAL HYGIENE 1 (1-0).

401 ORAL ROENTGENOLOGY 3 (2-4). Radiographic techniques exposure chemistry and processing of films, record keeping and mounting of films; direct application of dental hygiene. Laboratory procedures involving experience of technique, processing, mounting, etc.

402 CLINICAL ORAL PROPHYLAXIS 3 (2-12). Clinical experience in the performance of oral prophylaxis, topical application, dental health instruction to patients. Close supervision.

403 COMMUNITY DENTAL HEALTH EDUCATION 3 (3-0). (Recommended Education 494 Seminar: Dental Health and Public School Organization as a prerequisite). Application of educational principles to dental health teaching; instruction in planning for community dental health programs including actual dental survey experience; evaluation of dental health teaching materials. Study of established dental health education programs.

404 SEMINAR IN DENTAL HYGIENE 1 (1-0). Professional education in the field of dental hygiene, licensing, legislation, organization, and literature. Responsibilities of the dental hygienist to the community.

410 FIELD PRACTICE 3 (2-12). Observation and participation in dental hygiene program of local schools, inspections and classroom talks. Research surveys, recording and compiling data. Some advanced dental hygiene practice in the University Clinic under supervision.

411 PROBLEMS IN DENTAL HYGIENE 2 (2-0). Field of practice problems, background, objectives, program and evaluation.

412 DENTAL LITERATURE 1 (0-0). Research and its application to dental health education.
study is designed to train the student in acting, directing, design, playwriting and the technical phases of dramatic production and to give him experience in these areas; to prepare him to teach and direct in the high school theater and the college and university theater; and to relate through the study of the art of the theater the place of theater in the societies of the past and the present. The University of Montana Drama Department offers work leading to the Bachelor of Arts, Bachelor of Fine Arts, Master of Arts and Master of Fine Arts degrees in drama.

The B.A. and M.A. programs are oriented more towards a liberal arts concept, the B.F.A. and M.F.A. programs toward pre-professional and professional training in the theater arts.

University of Montana graduates in theater and drama are presently teaching in high school theater, teaching in college and university theater, radio, the motion picture, television, and the professional theater.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN DRAMA. In addition to the general requirements listed earlier, the following special requirements must be completed for the Bachelor of Arts degree with a major in drama: Drama 101, 121-122-123, 131-132-133, 201-202-203, 244, 251, 301-302-303, 311, 490 (4 cr.), plus a minimum of 6 additional elective credits in Drama. All drama majors are required to enroll in Drama 260 or 300, Drama Workshop, for three years.

The following courses outside the drama department are required: English 100, 300, 450 and 343. HPER, 3 credits in ballet, modern dance or fencing. Group requirements I, II, III. (Drama requirements meet Group IV.)

The foreign language requirement listed earlier in the catalog must be satisfied for the Bachelor of Arts degree.

Senior comprehensive examinations are required for all graduating students.

Seniors must submit for graduation an original play, or a prompt book for the production of a play and also must direct a play.

Candidates for the Bachelor of Fine Arts degree will meet the same requirements as for the Bachelor of Arts degree except that the aggregate number of credits in the Department of Drama must be a minimum of 80 hours. The specific additional courses will depend upon the student's area of emphasis. A foreign language is not required for this degree.

DRAMA MAJORS PLANNING TO TEACH in Montana secondary schools must take, in addition to their Drama major, a teaching Minor. Ordinarily English should be the teaching minor chosen. Course requirements in Education to meet teacher certification with the aggregate number of credits in the Department of Drama must meet Group requirements I, II, III, IV. (Drama requirements meet Group IV.)

Drama majors electing the teaching major are exempted from Drama 301 and 302. Due to credit limitations, the B.A. degree is suggested.

PROGRAM FOR THE B.A. AND B.F.A. DEGREES

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<th>Quarter</th>
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<th>W</th>
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<td>Drama 121-122-123</td>
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<td>Drama 200</td>
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<td>Drama 251</td>
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<td>English 100</td>
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<td>Language (French recommended) or Electives from Groups I, II, III</td>
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<td>Drama 244</td>
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<tr>
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<td>Drama 301, 302, 303</td>
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<td>Drama 311</td>
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ECONOMICS

is that branch of the social sciences which deals with man's efforts to satisfy his wants by utilizing the scarce means provided by nature. The department considers its teaching goals to be three: (1) To present to students the basic theoretical tools of economic analysis, relevant facts and institutional material, which will assist them in later study in economics, business administration, political science, and other social sciences; (2) To introduce students majoring in economics to the various special fields of study within economics. This training along with extensive work in the other liberal arts and sciences, is intended to instill breadth of intellectual interest, critical habits of thought, a problem-solving attitude, and facility of expression. (3) To help meet, through graduate work, the increasing demands for competent professional economists in industry, commerce, government and education.

Courses cover general economic theory, public finance and taxation, labor economics, monetary theory and prices, international economics, public utilities and comparative economic systems.

Students may major in economics leading to a Bachelor of Arts or Bachelor of Science degree or a combination of economics and political science. Graduate work leading to a Master of Arts degree with a major in economics or a combination in all the arts of the theater.

The requirements for the Bachelor of Science degree with a major in Economics are the same as for the Bachelor of Arts degree with a major in Economics, except that the foreign language requirement does not apply. Mathematics 153 and General 141-142-143 (Humanities) are required.

Unless circumstances peculiar to the student's best interest indicate otherwise, the student shall complete the sophomore or junior year, Economics 201-202-203; Mathematics 116 (or equivalent), 125, Computer Science 101; Political Science 201; History 201-202; Anthropology 133-134; Sociology 110; in the junior or senior year, Economics 301 and 311. It is strongly recommended that all students majoring in economics take Business Administration 460 as directed by the chairman of the department. It is also suggested that the student take Business Administration 201-202.

The following may be counted as part of the 50 credits required for a major in Economics: Geography 211; History 347-348-349, 373-374; Political Science 365; Mathematics 118 or 153, 344-345; and Business Administration 360. It is recommended that the student take Business Administration 201-202.

Economics-Mathematics concentration. In addition to the diversification requirements listed above the student may elect a concentration in Economics and Mathematics. This concentration shall include: Economics 201-202-203, 301, 311-312-313, 350-351, and 451-452, and Mathematics 341-342-343 or 344-345-346 and one year of calculus. (This program is not a joint major but represents instead concentrated undergraduate preparation for graduate study in theoretical economics.)

COMBINED MAJORS. Minimum of 60 credits. Combined majors in economics and political science may be earned by meeting the following requirements with the remainder of credits selected according to the student's interests. Economics 201-202-203; Mathematics 125; Economics 301, 311, and at least 12 additional credits in the division of economics and Mathematics 341-342-343 or 344-345-346 and one year of calculus. (This program is not a joint major but represents instead concentrated undergraduate preparation for graduate study in theoretical economics.)

FOR UNDERGRADUATES AND GRADUATES

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

ECONOMIC SYSTEMS


INTERMEDIATE ECONOMIC ANALYSIS 4 prereq 201, (311) Theory of the firm. (312) Input analysis and welfare comparisons. 3 prereq

DEVELOPMENT 4 prereq (311) Theoretical analysis; (312) Input analysis and welfare comparisons. 3 prereq

ECONOMIC THEOR Y 4. S 2. Su 3 prereq 203. (315) Economic ideas from early times to 1890. (31x) Economic theories from 1890 to the present.

LABOR ECONOMICS 3 prereq 203. (321) Institutional and legal background of labor markets. (322) Economics of labor markets.

INDUSTRIAL RELATIONS 3 prereq 203. Problems and public policy in labor-management relations.

INTRODUCTION TO INTERNATIONAL ECONOMICS 4. S 3. prereq 203. (31x) Theoretical analysis; (33x) Problems of policy-making.


ECONOMIC DEVELOPMENT 4 prereq 203. Theoretical determinants of economic growth in large and rich countries.

PUBLIC UTILITY ECONOMICS 3 prereq 203. Analysis of costs and pricing policies; economic aspects of regulation.

ECONOMICS OF TRANSPORTATION 3 prereq 203. Economic significance, systems, freight rates and their relations to location of industries and market centers, regulation.

COMPARATIVE ECONOMIC SYSTEMS 4, Su 3, prereq 203. Capitalism, fascism, socialism, communism; evaluation.

THE RUSSIAN ECONOMY 4, Su 3 prereq 203.

MONOPOLY AND COMPETITION 3 prereq 311. Theories of imperfect markets and workable competition as applied to public policy.
EDUCATION—29

ADMISSION TO TEACHER EDUCATION. Students preparing to teach in the elementary grades should major in Education; those preparing to teach particular subjects, either in junior or senior high schools, major in the principal subject to be taught or in Education. All elementary and secondary applicants should consult the School of Education office at the earliest opportunity and receive assistance in planning a program of studies which will be most relevant to their teaching objectives. All students preparing to teach must apply for admission to teacher education at the time they enroll for Education 200. To be admitted to teacher education, a student must have a grade point average of 2.0 or better.

ADMISSION TO STUDENT TEACHING. Application for student teaching must be made on forms obtained from the Director of Student Teaching.

Elementary: to qualify for this assignment, the student must (1) earn a cumulative gpa of 2.3 or better, (2) have no grade below C in Education courses, (3) have the consent of the Director of Student Teaching and be registered in or have completed one or more courses in methods of elementary teaching.

Secondary: to qualify for this assignment, the student must (1) have a cumulative gpa of 2.3 or better, (2) have no grade below C in Education courses, (3) have completed at least 50% of the work in the major teaching field (and minor, if any) with a minimum gpa of 2.3 in the major teaching field (and minor, if any), (4) have the consent of the Director of Student Teaching.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN EDUCATION. In addition to the general requirements for graduation listed earlier in the catalog, candidates for the degree of Bachelor of Arts in Education will meet the following requirements:

Preparation for Teaching in the Secondary Grades: Candidates majoring in a minor field of specialization shall complete 40 credits in Education, including Education 200, 205, 305, 405 (10 credits), 497, 498, and at least one course in each of the following areas: (a) educational sociology or history of philosophy of education; (b) audiovisual, multimedia, or library service; (c) counseling, guidance, remedial or special education; and (d) special methods in a major teaching field. Students wishing to qualify for standard secondary teacher certification are required to earn at least 60 or more credits in a major teaching field, credit in a minor teaching field, and 60 or more credits in a minor teaching field or to earn 60 or more credits in an extended major teaching field. Requirements for major and minor teaching fields may be found in the last few pages of the Education section of the catalog.

SUGGESTED CURRICULUM IN SECONDARY EDUCATION

Freshman Year

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<tr>
<th>Course</th>
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<td>Eng. 100, Lower Division Composition</td>
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<tr>
<td>Group Requirements: Life Sciences</td>
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<td>Group Requirements: Humanities</td>
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<tr>
<td>Electives in Courses in Advanced or/and Minor Teaching Fields</td>
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<tr>
<td>HPER 100 or 115-120, Physical Education or Prof. Activities</td>
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Sophomore Year

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<tbody>
<tr>
<td>Eng. 300, Upper Division Composition</td>
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</tr>
<tr>
<td>Group Requirements: Physical Sciences or Math</td>
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</tr>
<tr>
<td>Group Requirements: Humanities</td>
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<tr>
<td>Edu. 200, Orientation to Education</td>
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<td>Edu. 205, Educational Research I</td>
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<td>Electives or Courses in Major and/or Minor Teaching Fields</td>
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Junior and Senior Years

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<th>Cr.</th>
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<tbody>
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<td>Eng., An Advanced Course in Composition</td>
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</tr>
<tr>
<td>Edu. 452, Educational Measurement</td>
<td>4</td>
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<tr>
<td>Edu., Required Courses from Options Allowed</td>
<td>12</td>
</tr>
<tr>
<td>Edu. 305, Secondary School Teaching Procedures</td>
<td>5</td>
</tr>
<tr>
<td>Edu. 405, Student Teaching: Secondary</td>
<td>10</td>
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<tr>
<td>Edu. 407, Problems in Teaching</td>
<td>3</td>
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<tr>
<td>Electives or Courses in Major and/or Minor Teaching Fields</td>
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Preparation for Teaching in the Elementary Grades. Candidates must earn a minimum of 45 credits in Education including the following required courses totaling 43 credits: Education 200, 205, 309, 310, 311, 312, 340, 404, 407.

In addition, the student will complete the work in the following areas: English, 31 credits; Science, 18 credits; Mathematics, 9 credits; Health, Physical Education and Recreation, 8 credits; Art, 6 credits; and Social Studies, 6-8 credits.

For elementary teachers, Group I and II requirements may be satisfied by the following: General 125, 126, 127, and 9 credits in Mathematics. Other general requirements are normally satisfied by completion of the program.

It is recommended that elementary teachers take Health, Physical Education and Recreation 115-120 as part of their required work in Physical Education during the freshman and sophomore years.

Elementary Education majors may use their electives to strengthen any of the required academic fields, or to complete a minor in any of the following areas: Art, Music (vocal only), Foreign

382 CONTEMPORARY ECONOMIC PROBLEMS 3 prereq 203.
383 LAND ECONOMICS 3 prereq 301. Economic and physical characteristics of land and the institutional background of real property; classifications of properties and market analysis; cyclical market fluctuation; impact of supply and demand; city growth, structure and planning; land use control, and real estate investment analysis.
406 MONETARY THEORY 4 prereq 301.
410 ADVANCED ECONOMIC ANALYSIS 4 prereq 25 credits in economics including 311.
451-452 MATHEMATICAL ECONOMICS 4 prereq 311 and Math 118 or =. (451) Constrained maximization, maximization over time; (452) Input-output analysis, general equilibrium and programming, utility theory and game theory models.
460-461 (350-351) ECONOMETRICS 4 prereq Math 125; 118 or 122 (350). General linear regression models; (351) Econometric theory and multiple equations theory.
490 ADVANCED PROBLEMS V 1-2 R-6 prereq 12 credits in economics and c/l.
495 SEMINAR IN ECONOMICS V 1-3 R-12 prereq c/l.
501 GRADUATE RESEARCH V R-4.
510-511-512 ECONOMICS 3. Elements of analytical economics: the American economy, characteristics, performance, macro-economics, monetary and business cycles, economic growth and stabilization; markets, pricing of outputs and inputs, government regulation; distribution theory and public policies; the public economy; the world economy, and the economic development. (Open only to MBA and MRA students.)
699 THESIS V R-15.

EDUCATION

Teacher education at the University of Montana prepares for teaching in any of the twelve grades. Prospective elementary and secondary teachers must have earned a bachelor's degree, have satisfactorily completed certain specified courses, and have demonstrated competence in student teaching before they become eligible for recommendation by the University of Montana for state certification to teach. Patterns of courses to be completed are planned in terms of the particular fields in which the student expects to teach. After they have been granted a bachelor's degree and have been certified to teach, persons in Education may take advanced work at the graduate level which will prepare them for specialized positions such as school administrator, supervisor, counselor, coordinator, reading specialist, and research director; or build up their backgrounds in the field or fields which they teach. The University of Montana offers graduate work leading to the master's and doctor's degrees. A six-year program in school administration (two years of graduate work beyond the bachelor's degree) is offered. The program is designed for practicing and prospective school administrators of demonstrated ability and promise. Admission to the Graduate School is a prerequisite for admission to graduate programs.

General certification requirements for Montana's elementary, junior and senior high schools are set forth below. In addition to satisfying course, credit, and degree requirements, an applicant for certification in Montana must be (1) a citizen of the United States (provisional certification is available for non-citizens upon request of a board of trustees), (2) at least 18 years of age, and (3) able to present a satisfactory health certificate signed by a physician. Additional information may be secured from the Dean of the School of Education.

The School of Education at the University of Montana is accredited by the National Council for the Accreditation of Teacher Education and by the Northwest Association of Secondary and Higher Schools.

KEEP IT BRIGHT
Language, Health, Physical Education and Recreation, Library Science, Special Education. Approved minor patterns are available at the University of Montana Office of Education.

Any student who plans to do student teaching in the kindergarten must have completed Education 331, Early Childhood Education, before registering for student teaching.

Suggested Curriculum in Elementary Education:

Freshman Year

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<th>Course</th>
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<tr>
<td>Gen. 125-126-127, Science for Elementary Teachers</td>
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<tr>
<td>Soc. 110, Social Practice of Teaching</td>
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<tr>
<td>Gen. 161-162-163, Introduction to the Humanities</td>
<td>9</td>
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<tr>
<td>Geog. 101, Physical Elements of Geography</td>
<td>3</td>
</tr>
<tr>
<td>Mus. 122-123-124, Music Education in the Elementary Schools</td>
<td>8</td>
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<tr>
<td>HPER 100 or 115-120, Physical Education or Prof. Activities</td>
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Sophomore Year

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<tr>
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<tr>
<td>Educ. 201, Education Laboratory</td>
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<tr>
<td>Educ. 202, The Elementary School Child</td>
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<tr>
<td>Eng. 300, Upper Division Composition</td>
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</tr>
<tr>
<td>HPER 199, First Aid</td>
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<tr>
<td>Hist. 200-202, United States History</td>
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<td>Math 130, Theory of Arithmetic</td>
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<td>Pol 201, American Government</td>
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<tr>
<td>Soc. Sci, Elective Courses</td>
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Junior and Senior Years

<table>
<thead>
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<td>Educ. 340, Survey of Children's Literature</td>
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<td>Educ. 303, Teaching Elementary School Reading</td>
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</tr>
<tr>
<td>Educ. 309, Teaching Elementary School Mathematics</td>
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</tr>
<tr>
<td>Educ. 310, Teaching Elementary School Social Studies</td>
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<tr>
<td>Educ. 311, Teaching Elementary School Science</td>
<td>3</td>
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<tr>
<td>Educ. 312, Teaching Elementary School Language Arts</td>
<td>3</td>
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<tr>
<td>Eng. 326, Advanced Course in Composition</td>
<td>3</td>
</tr>
<tr>
<td>Art 303-304, Elementary School Art</td>
<td>6</td>
</tr>
<tr>
<td>Gen. 300, Conservation of Natural and Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>HPER 312, Teaching Physical Education in Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>HPER 373, The School Health Program</td>
<td>3</td>
</tr>
<tr>
<td>Soc. Sci, Elective Courses</td>
<td>5</td>
</tr>
<tr>
<td>Educ. 464, Student Teaching: Elementary</td>
<td>15</td>
</tr>
<tr>
<td>Educ. 467, Problems in Teaching</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>24-38</td>
</tr>
</tbody>
</table>

30-EDUCATION

For undergraduate students who have completed a four-year course of elementary school education, the four-year course should include:

1. A bachelor's degree from the University of Montana or other approved institution of higher education.
2. Twenty-four or more quarter credits in Education designated by the Dean of the School of Education (see Preparation for Secondary Teaching below).
3. Preparation in one or more special subject areas commonly taught in the secondary schools as indicated under COURSE REQUIREMENTS IN MAJOR AND MINOR TEACHING FIELDS, listed later.

Academic and professional requirements for University recommendation for certification to teach in fully accredited elementary schools of Montana are as follows:

1. Bachelor's degree from the University of Montana or other approved institution of higher education; the holder has completed a four-year course of elementary school education.
2. Specific requirements in general education that have particular reference to teaching areas in the elementary grades.

Students who expect to be certified to teach in the secondary grades are required to file with the School of Education at least two quarters preceding the quarter of practice teaching a statement of their intended teaching fields. Those students who expect to be certified to teach in the elementary grades will similarly submit a statement setting forth their proposed programs. Each candidate for a certificate who has not already received credit in Student Teaching (Educ 464 or 465) will be assigned definite quarters in which he must register for that course.

SEQUENCE OF CERTIFICATION COURSES IN SECONDARY EDUCATION TO BE TAKEN BY STUDENTS NOT MAJORING IN EDUCATION.

Sophomore year: Educ. 200, 2 credits.

Junior year: Educ. 205, 4 credits.

Senior year: Educ 305, 5 credits; 405, 10 credits; 407, 3 credits.

SEQUENCE OF CERTIFICATION COURSES IN ELEMENTARY EDUCATION. Since certification for teaching at the elementary level is based solely upon the Bachelor's Degree in Elementary Education, see the preceding section on preparation for teaching in the elementary grades for requirements.

Variations from these patterns of required courses for elementary and secondary standard teaching certification are permissible only with the approval of the Dean of the School of Education.

PREPARATION FOR PROFESSIONAL CERTIFICATION. The Montana professional certificate is issued to applicants having 3 or more years successful teaching experience who have completed a minimum of 45 quarter credits in approved courses beyond the bachelor's degree. Students intending to qualify for this certificate are required at the beginning of the program to outline such programs with and receive approval from the Dean of the School of Education.

PREPARATION FOR SCHOOL LIBRARIANS. The library service program is designed to train school and teacher-librarians to meet the requirements of the Northwest Association of Secondary and Higher Schools and of the state of Montana. The minimum requirement for schools of under 100 enrollment includes Education 334, 335, 336, 337, 338, and 345. The student planning a more extended program should consult the library service instructor for advice on additional courses.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)


2. EDUCATION LABORATORY V R-6 prereq c/l.

3. THE ELEMENTARY SCHOOL CHILD 5 prereq 200, coreq 201. Principles of growth and development and the psychology of learning as applied to the elementary school child. A minimum of 2 hours per week will be spent in observation of children in the school environment.

4. EDUCATIONAL PSYCHOLOGY 4 prereq 200. The growth and developmental characteristics of adolescents. Psychological and sociological foundations of learning in the junior and senior high schools.

5. METHODS OF TEACHING PHYSICAL EDUCATION ON THE SECONDARY LEVEL. (See Health, Physical Education and Recreation.)

6. SECONDARY SCHOOL TEACHING PROCEDURES 5 prereq 200 and 205.

7. TEACHING ELEMENTARY SCHOOL READING 3 prereq 302.

8. TEACHING ELEMENTARY SCHOOL MATHEMATICS 3 prereq 202 and an introductory course in modern mathematics or c/l.


10. TEACHING ELEMENTARY SCHOOL SOCIAL STUDIES 3 prereq 202.

11. TEACHING ELEMENTARY SCHOOL LANGUAGE ARTS 3 prereq 202.

12. SCHOOL MUSIC. (See Music.)

13. METHODS IN TEACHING HEALTH. (See Health, Physical Education and Recreation.)

14. ELEMENTARY V R-6 prereq or coreq an elementary methods of teaching course and c/l.

15. SECONDARY V R-6 prereq or coreq 305 or c/l.

16. STUDENT TEACHING: ELEMENTARY V R-15 prereq 200, and consent of Director of Student Teaching.

17. STUDENT TEACHING: SECONDARY V R-10 prereq 200, and consent of Director of Student Teaching.

18. PROBLEMS IN TEACHING 3 prereq c/l. Current problems and issues in teaching.

FOR UNDERGRADUATES AND GRADUATES

19. METHODS OF TEACHING EARTH SCIENCE. (See Geography.)

20. METHODS OF TEACHING SECONDARY ART. (See Art.)

21. SCHOOL PUBLICATIONS AND TEACHING METHODS. (See Journalism.)

22. METHODS OF TEACHING BIOLOGY. (See General.)

23. TEACHING OF ENVIRONMENTAL EDUCATION 3 prereq Gen 306 and c/l.
327 PROBLEMS IN ENVIRONMENTAL EDUCATION 3 prereq c/i. Designing, selection, and evaluation of materials for the teaching of Environmental Education.

328 METHODS OF TEACHING PHYSICS. (See Physics.)

329 METHODS OF TEACHING HIGH SCHOOL CHEMISTRY. (See Chemistry.)

331 EARLY CHILDHOOD EDUCATION 3 prereq c/i. Theory and techniques of teaching in pre-school and primary levels of education. Observation and participation in pre-school programs. Required for kindergarten and primary teachers.

334 REMEDIAL READING 3 prereq a basic course in teaching of reading or teaching experience, and c/i. Diagnosis and treatment of reading difficulties at elementary, secondary and college levels. Required for remedial teachers, remedial supervisors, elementary principals and administrators who wish to initiate remedial programs.

340 SURVEY OF CHILDREN'S LITERATURE 3.

341 ADMINISTRATION OF THE SMALL PUBLIC AND COLLEGE LIBRARY 4 prereq c/i. Objectives of library service, library routines in a school, public or college library under the supervision of a trained professional librarian. Functions and use of classroom and schoolroom libraries; the professional place in governmental organization, library extension work.

342 INTEGRATING MULTI-MEDIA MATERIALS IN INSTRUCTION 3.

343 ORGANIZATION AND ADMINISTRATION OF THE SCHOOL LIBRARY 3.

344 CATALOGING AND CLASSIFICATION 4, Su 3 prereq c/i.

345 MATERIALS SELECTION AND BIBLIOGRAPHY 4, Su 3 prereq c/i.

346 LIBRARY REFERENCE MATERIALS 4, Su 3 prereq c/i.

347 AUDIOVISUAL COMMUNICATION 3. Utilization of sound and visual teaching aids; intensive laboratory work in basic instructional materials and operation of AV equipment.

360 EDUCATIONAL SOCIOLOGY 3. Education in modern social, economic, and political life; the school as a social institution; class problems of American life which affect and are affected by the work of the public schools.

370 THE TEACHER AND SCHOOL ORGANIZATION 3. The teacher's relationship to the organization, management, and financing of public education with special emphasis on personnel problems, community relations, and organizational structure of schools.

373 THE SCHOOL HEALTH PROGRAM. (See Health, Physical Education and Recreation.)

380 METHODS OF TEACHING TYPEWRITING. (See Business Administration.)

381 METHODS OF TEACHING BOOKKEEPING AND BASIC BUSINESS 3 prereq c/i.

382 METHODS OF TEACHING ENGLISH. (See English.)

385 PHILOSOPHY OF VOCATIONAL BUSINESS EDUCATION

(See Business Administration.)

386 PRACTICES IN VOCATIONAL BUSINESS EDUCATION.

(See Business Administration.)

387 COOPERATIVE VOCATIONAL BUSINESS EDUCATION PROGRAMS. (See Business Administration.)

390 METHODS OF TEACHING FOREIGN LANGUAGES. (See Foreign Languages.)

395 METHODS OF TEACHING FOREIGN LANGUAGES IN ELEMENTARY SCHOOLS. (See Foreign Languages.)

411 SUPERVISION AND TEACHING OF THE LANGUAGE ARTS 3 prereq teaching experience and c/i. Methods and techniques of teaching English arts in the elementary school.

412 SUPERVISION AND TEACHING OF READING 3 prereq teaching experience and c/i. Characteristics of good reading programs and their development; in accordance with present day understandings of children and youth.

414 SUPERVISION AND TEACHING OF SOCIAL STUDIES IN THE ELEMENTARY SCHOOL 3 prereq teaching experience and c/i. Curricular trends, instructional practices, teacher-pupil planning and evaluation, unit organization, integration with other areas, and use of community resources.

417 SUPERVISION AND TEACHING OF ARITHMETIC 3 prereq teaching experience and c/i. Curriculum trends, instructional materials, research, and supervisory techniques relevant to a modern elementary school arithmetic program.

418 (318) SUPERVISION AND TEACHING OF SCIENCE IN THE ELEMENTARY SCHOOLS 3 prereq Gen. 125-126 or c/i. Teaching experience and c/i. Curriculum planning, development and use of instructional materials, teaching procedures.

420 METHODS OF TEACHING SECONDARY SCIENCE 3 prereq 205, a science minor and c/i. Problems involved in development of an adequate high school science program; curriculum methods, instructional materials.

421 METHODS OF TEACHING HOME ECONOMICS. (See Home Economics.)

422 TEACHING SPEECH IN THE SECONDARY SCHOOL. (See Speech Communication.)

423 PRINCIPLES AND PRACTICES IN TEACHING OF SECONDARY MATHEMATICS 3 prereq completion of at least ½ of the major or minor teaching field in mathematics.

424 METHODS OF TEACHING COMMUNICATION SKILLS 3 prereq 205, 360, 391, 407 or c/i. Diagnosis and remedial experiences, reading, guidance, and teaching library skills. Responsibilities of classroom teachers, elementary librarians, library supervisors, elementary principals and administrators.

426 ADVANCED TRAFFIC SAFETY EDUCATION 3 prereq a basic course in driver training or experience in teaching driver training. For students who have had experience in this field. General traffic education.

427 READING IN JUNIOR AND SENIOR HIGH SCHOOL 3 prereq 205 or =. Programs, materials, testing, reading in the content fields, research, and development.

428 METHODS OF TEACHING SOCIAL STUDIES IN SECONDARY SCHOOLS 3 prereq 205 or teaching experience. Problems involved in the teaching of social studies in junior and senior high school curriculums. Study of presentation of units of instruction, selection and use of materials.

431 THE SLOW AND RETARDED LEARNERS 3 prereq 12 credits in Education. Needs, aims, traits, identification, curriculum, teaching methods, and research.

432 THE BRIGHT AND GIFTED PUPILS 3 prereq 12 credits in Education. Needs, aims, traits, identification, curriculum, teaching methods, and research.

436 REMEDIAL READING LABORATORY 3 R-9 prereq or coreq 1 and c/i. Supervised practice in diagnosis and remedial instruction.

438 ADMINISTRATION OF THE INTERMEDIATE SCHOOL 3 prereq teaching experience and c/i. Administration of general school programs, classrooms, and co-curricular activities in middle schools or junior high schools.

440 LIBRARY PROGRAMS IN ELEMENTARY SCHOOLS 3 prereq experience in children's literature and use of classroom collections and centralized libraries for curriculum enrichment experiences, reading guidance, and development of library-skills. Responsibilities of classroom teachers, elementary librarians, library supervisors, elementary principals and administrators.

442 EVALUATION OF SCHOOL LIBRARY SERVICES AND MATERIALS 3 prereq 12 credits in Library Service. Methods of evaluating and improving school library services to teachers and students.

442 LIBRARY WORK WITH CHILDREN 3 prereq c/i. and a course in library service. Group work with children in public libraries, including story telling and organization of the children's department in the public library.

443 LIBRARY WORKSHOP 3 R-9 prereq c/i. Problems of library service. Group sessions and committee work; individual work on problems of special interest within the workshop topic.

444 LIBRARY SEMINAR V R-10 prereq 12 or more hours in Library Service and consent of the Director of Library Service. Independent study and research. Group analysis and discussion of individual projects.

445 LIBRARY PRACTICE 5 prereq c/i. The student performs library routines in a school, public or college library under the supervision of a trained professional librarian.

447 PREPARATION OF INEXPENSIVE INSTRUCTIONAL MATERIALS 3 prereq 347. Selected and utilization of major types of audiovisual materials for an instructional communication system.

449 ADMINISTRATION OF AUDIOVISUAL COMMUNICATIONS PROGRAMS 3 prereq basic courses in field or c/i. Management and operation of guidance services in communications media for elementary or secondary school programs.

450 SECONDARY SCHOOL GUIDANCE 4 prereq 205 or teaching experience. Orientation to the need, organization, and methodology of guidance services in the elementary schools.

451 GUIDANCE IN THE ELEMENTARY SCHOOL 4 prereq 306, 308, 310, 311, 312 or teaching experience. Orientation to the need, organization, and methodology of guidance services in the elementary schools.

452 EDUCATIONAL MEASUREMENT 4 prereq 205 or teaching experience. Basic principles of measurement of educational outcomes in elementary and secondary teaching; application of statistical techniques to educational data; analysis of standardized tests; construction and use of teacher-made tests.

461-462 HISTORICAL FOUNDATIONS OF AMERICAN EDUCATION 3. Enter either quarter. (461) to 1650; (462) 1650 to present.

490 INDEPENDENT STUDY V R-10 prereq c/i. Selected topics under the guidance of a staff member. Term papers may be required.
**EDUCATION—33**

**BIOLOGICAL SCIENCE**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(97-99 credits)</td>
<td>(52-54 credits)</td>
</tr>
</tbody>
</table>

- **Micro 200—General Microbiology**
- **Bot-Zool 111—Introduction to Biology**
- **Bot 114—General Botany**
- **Zool 112—General Zoology**
- **Zool 395—Local Flora (or Zool 266)**
- **Zool 250—Basic Concepts of Ecology (or Bot 335)**
- **Bot-Zool 455—Genetics**
- **Gen 200—Conserv. of Nat. & Hum. Resources**
- **Gen-Educ 322—Methods of Teaching Biology**
- **Gen 122—Evolution, Genetics, and Man**
- **Chem 160—Survey**
- **Chem 121—2-3—College Chemistry**
- **Chem 481—Elementary Biochemistry**
- **Geog 101—2-3—Intro. to Environmental Geology**
- **Chem 245—Quantitative Analysis**
- **Chem 261—Organic Chemistry**
- **Chem 370—Survey of Physical Chemistry**
- **Chem 482—Physical Inorganic Chemistry**
- **Geol 114—Survey of Earth Science**
- **Geography (or Phys 111-2-3)**

**Elective—Upper Division Chemistry Courses**

- **Students presenting a minor field in Chemistry should substitute Chem 121-2-3.**
- **Minors may substitute Bot 369 or Gen. 300 for Bot-Zool 250.**

**BUSINESS ADMINISTRATION (SECRETARIAL)**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(54-60 credits)</td>
<td>(39-45 credits)</td>
</tr>
</tbody>
</table>

- **Bus Ad 190 or **—Beginning Typewriting 0-2
- **Bus Ad 181 or **—Intermediate Typewriting 0-2
- **Bus Ad 182 or **—Advanced Typewriting 0-2
- **Bus Ad 183—Production Typewriting**
- **Bus Ad 184—5—Secretarial Practice** 15
- **Bus Ad 183—Beginning Secretarial Practice**
- **Bus Ad 194—Records Management**
- **Bus Ad 201-2-3—Accounting Principles** 9
- **Bus Ad 252—Office Machines Practice**
- **Bus Ad 257—Legal Environment of Business** 3
- **Bus Ad 370—Electronic Information Processing**
- **Bus Ad-Educ 380—Methods of Teaching Typewriting**
- **Bus Ad-Educ 381—Methods of Teaching Bookkeeping & Business**
- **Bus Ad 383—Office Practice**
- **Bus Ad-Educ 384—Methods of Teaching shorthand & Transcription**
- **Bus Ad 385—Philosophy of Vocational Business Education** 3
- **Econ 201—Principles of Economics** 3

*Note: Montana Vocational Certification requirement may be completed by taking Bus Ad 386 and 387 in addition to the above courses.*

**BUSINESS ADMINISTRATION (NON-SECRETARIAL)**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(54-60 credits)</td>
<td>(39-45 credits)</td>
</tr>
</tbody>
</table>

- **Bus Ad 190 or **—Beginning Typewriting 0-2
- **Bus Ad 181 or **—Intermediate Typewriting 0-2
- **Bus Ad 182 or **—Advanced Typewriting 0-2
- **Bus Ad 183—Production Typewriting**
- **Bus Ad 185—Beginning Secretarial Practice**
- **Bus Ad 194—Records Management**
- **Bus Ad 201-2-3—Accounting Principles** 9
- **Bus Ad 252—Office Machines Practice**
- **Bus Ad 257—Administrative Accounting** 9
- **Bus Ad 377—Legal Environment of Business** 3
- **Bus Ad 376—Electronic Information Processing**
- **Bus Ad-Educ 380—Methods of Teaching Typewriting**
- **Bus Ad-Educ 381—Methods of Teaching Bookkeeping & Business Administration**
- **Bus Ad 385—Office Management**
- **Bus Ad-Educ 388—Methods of Teaching Business Education**
- **Bus Ad 401—Income Tax**
- **Econ 202—2-3—Principles of Economics** 3
- **Econ 301—Money and Banking**

**CHEMISTRY**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(47 credits)</td>
<td>(39 credits)</td>
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</tbody>
</table>

- **Chem 121-2-3—College Chemistry** 15
- **Chem 245—Quantitative Analysis**
- **Chem 261—Organic Chemistry** 10
- **Chem-Educ 329—Methods of Teaching High School Chemistry**
- **Chem 370—Survey of Physical Chemistry**
- **Chem 482—Physical Inorganic Chemistry**
- **Chem 481—Elementary Biochemistry**
- **Electives—Upper Division Chemistry Courses**

*Prereq = Phys 111-2-3 (18 cr.); Math 115-7 (10 cr.).

**COMMUNICATION SKILLS**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(52 credits)</td>
<td>(37 credits)</td>
</tr>
</tbody>
</table>

- **SpCo 110—Introduction to Systems of Communication** 5
- **SpCo 112—Argumentation** 5
- **SpCo 113—Introduction to Communication: Process**
- **SpCo 114—the Discussion and Small Groups**
- **SpCo 353—General Semantics**
- **SpCo 355—Message Composition**
- **SpCo 356—Speech Criticism**
- **SpCo 361—Oral Interpretation**
- **SpCo-Educ 424—Methods of Teaching Communication Skills**
- **SpCo 440—Advanced Public Speaking**
- **SpCo 444—Rhetorical Theory**
- **Eng 100—Lower Division Composition**
- **Eng 201—Introduction to Creative Writing**
- **Eng 300—Upper Division Composition**
- **Eng 400—Advanced Composition**
- **Eng 371—Structure of Modern English**
- **Jour 270—Reporting**
- **Jour-Educ 316—School Publications and Teaching Methods**
- **Jour 280—Magazine Article Writing**

*Minors may substitute SpCo 112 for SpCo 110.*

**COMPUTER SCIENCE**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(45 credits)</td>
<td>(37 credits)</td>
</tr>
</tbody>
</table>

- **CS 101—Introduction to Computing**
- **CS 201—Fortran Programming**
- **CS 212—Cobol**
- **CS 271—2-3—Computing and Mathematics**
- **CS 301—3—Introduction to Programming**
- **CS 312—Systems Analysis**
- **CS 320—Switching Theory**
- **CS 37—Application of Digital Computers**
- **CS 401—2-3—Advanced Programming**
- **CS 450—Computer Applications in Education** 1

*Prereq = Math 101 (6 cr.).

*Prereq = Math 116 (5 cr.).

*Prereq = Math 125 (5 cr.).

**DRAMA**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(40 credits)</td>
<td>(36 credits)</td>
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</tbody>
</table>

- **Dr Ad 101—Introduction to the Theater** 3
- **Dr Ad 102—Elementary Acting** 3
- **Dr Ad 121—2-3—Stagecraft** 12
- **Dr Ad 200—Beginning Theater Workshop** 6
- **Dr Ad 203—Dramatic Literature**
- **Dr Ad 244—Stage Make-Up** 2
- **Dr Ad 281—Stage Speech**
- **Dr Ad 293—History of the Theater** 3
- **Dr Ad 311—Directing** 4
- **Dr Ad 469—Seminar** 4
- **Elections—Any Course(s) in Drama** 5

*Placement in student teaching may not be possible; in this case provisional certification only will be available unless the student prefers another teaching field in which student teaching can be accomplished.*

**EARTH SCIENCE**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>(36 credits)</td>
<td>(36 credits)</td>
</tr>
</tbody>
</table>

- **Geog 101—Physical Elements of Geography** 5
- **Geog 201—Map Interpretation**
- **Geog 250—Climateology**
- **Geol 101—2—Introduction to Geology** 8
- **Geol 110—Field Methods**
- **Geol 200—General Paleontology**
- **Geol 302—Principles of Stratigraphy**
- **Geol 203—Regional Historical Geology**
- **Geol 210—Introduction to Rocks and Minerals**
- **Geol-Educ 306—Methods of Teaching Earth Science**
- **Geol-Educ—Geomorphology (or Geol 370)**

*For 210—Forest Soils**

- **Gen 300—Conservation of Natural and Human Resources**
- **Astronomy 131—Elementary Astronomy**
- **Elections—From Courses Listed Below**
- **Geol 103—Environmental Geology—4 cr.**
  **- Phys 115—General Physics—3 cr.**
  **- Bot-Zool 250—Basic Concepts**
  **- Cs 356—Ecology—3 cr.**
- **Geog 302—Physiol. of No. Amer.—6 cr.**
- **Geol 302—Field Geol. Nat. Sc. Tchr.—3 cr.**
- **Geol 320—Structural Geology—4 cr.**
- **Geol 408—Intro. Verteb. Paleo.—4 cr.**
- **Phys 410—Intro. Biophysics—3 cr.**

*Prereq = Chem 101-2 (8 cr.).

*Prereq = Phys 111 (5 cr.); Math 116-7 (10 cr.).

*Prereq = Geol 300 (4 cr.).

*Prereq = Math 116-7-8 (15 cr.); Phys 111 and 112 (10 cr.).
<table>
<thead>
<tr>
<th>ENGLISH—BROAD FIELDS (Major Only)</th>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 161-2-3—World Literature</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 200—Applied Literary Criticism</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENG 211-2-3—Introduction to Major British Writers</td>
<td>3 or 6</td>
<td>3 or 6</td>
</tr>
<tr>
<td>ENG 211-2-3—Introduction to Major American Writers</td>
<td>6 or 3</td>
<td>6 or 3</td>
</tr>
<tr>
<td>ENGL 342—Shakespeare (or 343)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 371—The Structure of Modern English</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 460—Advanced Composition</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 482—Literature for the High School Teacher</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives—Courses in English</strong></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Jour 290—History &amp; Principles of Journalism</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Jour-Educ 316—School Publications &amp; Teaching Methods</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives—Courses in Speech Communication, Drama, and Journalism</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>Students are expected to take two quarters of one sequence and one quarter of the other sequence from ENG 211-212-213 and 231-232-233.</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>English electives must include at least one upper division course in British literature and one in American literature. English electives may include General Literature courses and ENGL 360. A minimum of 45 credits must be taken. English 100 and 300 may not be included in the major.</strong></td>
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<td></td>
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</tbody>
</table>

### FRENCH

<table>
<thead>
<tr>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fr 101-2-3—Elementary French</strong></td>
<td>12</td>
</tr>
<tr>
<td><strong>Fr 201-2-3—Intermediate French</strong></td>
<td>12</td>
</tr>
<tr>
<td>Fr 301—Phonetics</td>
<td>3</td>
</tr>
<tr>
<td>Fr 303—Oral and Written Expression</td>
<td>3</td>
</tr>
<tr>
<td>Fr 305—French Civilization and Culture</td>
<td>3</td>
</tr>
<tr>
<td>Fr 402—Applied Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>Fr 405—Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td><strong>FL-Educ 330—Methods of Teaching French</strong></td>
<td>3</td>
</tr>
<tr>
<td>Electives—Any Upper Division French</td>
<td>15</td>
</tr>
<tr>
<td><strong>Foreign Language Department recommendation re student’s proficiency is prerequisite to French teaching.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits will be allowed for exempted courses.</strong></td>
<td></td>
</tr>
<tr>
<td>Must be taken in the junior year.</td>
<td></td>
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<tr>
<td>Minors may substitute Fr. 405.</td>
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<tr>
<td>Must include a minimum of 9 credits in period courses numbered from 321 to 335, inclusive.</td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL SCIENCE

(Major Only)

<table>
<thead>
<tr>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro 100—Elementary Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>Bot-Zool 111—Introduction to Botany</td>
<td>5</td>
</tr>
<tr>
<td>Bot 114—General Botany</td>
<td>5</td>
</tr>
<tr>
<td>Bot 265—Local Flora</td>
<td>5</td>
</tr>
<tr>
<td>Chem 101—General Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 160—Survey of Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Gen 360—Conservation of Natural and Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>Geol 101—Introduction to Geology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Phys 111-2-3—General Physics</strong></td>
<td>15</td>
</tr>
<tr>
<td>Astron 131—Elementary Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>Zool 112-3—General Zoology</td>
<td>10</td>
</tr>
<tr>
<td>Zool 206 —Field Zoology</td>
<td>3</td>
</tr>
<tr>
<td>Edu 420—Methods of Teaching Secondary Science</td>
<td>3</td>
</tr>
<tr>
<td>Electives—Courses from Geology, Botany, Chemistry, Physics, Zoology</td>
<td>4</td>
</tr>
<tr>
<td><strong>Prereq = Math 116-7 (12 cr.)</strong></td>
<td></td>
</tr>
</tbody>
</table>

### GEOGRAPHY

(Major Only)

<table>
<thead>
<tr>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 101—Physical Elements of Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 102—Introductory Human Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 201—Map Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>Geog 211—Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 300—Geography of North America</td>
<td>3</td>
</tr>
<tr>
<td>Geog 352—Cultural Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 345—Urban Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 358—Landform Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Geog 413—Population and Resource Geography</td>
<td>5</td>
</tr>
<tr>
<td>Edu 420—Methods of Teaching Secondary Science</td>
<td>3</td>
</tr>
<tr>
<td><strong>Electives—Courses from Social Science and Physical Science Areas</strong></td>
<td>27</td>
</tr>
<tr>
<td><strong>Provisional certification only will be available if the student presents another teaching area in which student teaching can be accomplished.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>18 credits should be selected from one department in the social science area or from one department in the physical science area; the remaining 9 credits should be from one department in the other area.</strong></td>
<td></td>
</tr>
</tbody>
</table>

### GERMAN

<table>
<thead>
<tr>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ger 101-2-3—Elementary German</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Ger 201-2-3—Intermediate German</strong></td>
<td>12</td>
</tr>
<tr>
<td>Ger 301-2—Oral and Written Expression</td>
<td>6</td>
</tr>
<tr>
<td>Ger 303—German Civilization and Culture</td>
<td>3</td>
</tr>
<tr>
<td>Ger 311-2—Survey of German Literature</td>
<td>3</td>
</tr>
<tr>
<td>Ger 401—Applied Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>Ger 402—Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td>FL—Educ 300—Methods of Teaching Foreign Languages</td>
<td>3</td>
</tr>
<tr>
<td>Electives—Any Upper Division German Courses</td>
<td>9</td>
</tr>
<tr>
<td><strong>Foreign Language Department recommendation re student’s proficiency is prerequisite to student teaching.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits will be allowed for exempted courses.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Must be taken in the junior year.</strong></td>
<td></td>
</tr>
<tr>
<td>Minors may substitute Ger 402.</td>
<td></td>
</tr>
</tbody>
</table>

### HEALTH, PHYSICAL EDUCATION AND RECREATION

<table>
<thead>
<tr>
<th>Major Field Credits</th>
<th>Minor Field Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPER 105—Concepts in Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>HPER 199—First Aid (or 399)</td>
<td>2 or 3</td>
</tr>
<tr>
<td>HPER 200—History and Principles of Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>HPER 215—220—Professional Activities</td>
<td>3</td>
</tr>
<tr>
<td>HPER 240—Care and Prevention of Athletic Injuries</td>
<td>3</td>
</tr>
<tr>
<td><strong>HPER 291—Introduction to Recreation</strong></td>
<td>3</td>
</tr>
<tr>
<td>HPER 290—Human Anatomy</td>
<td>1</td>
</tr>
<tr>
<td>HPER—Educ 301—Methods of Teaching Physical Education Secondary</td>
<td>2</td>
</tr>
<tr>
<td>HPER 300—Problems in Health, Physical Education and Recreation</td>
<td>1</td>
</tr>
<tr>
<td>HPER 339—Teaching Physical Education in Elementary Schools</td>
<td>3</td>
</tr>
<tr>
<td>HPER 350—The High School Intramural Program</td>
<td>2</td>
</tr>
<tr>
<td>HPER 355—Organization and Administration of Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>HPER—Educ 373—The School Health Program</td>
<td>3</td>
</tr>
<tr>
<td>HPER—Educ 375—Methods in Teaching Health</td>
<td>5</td>
</tr>
<tr>
<td>HPER 384—Applied Anatomy and Kinesiology</td>
<td>5</td>
</tr>
<tr>
<td>HPER 385—Preventive and Corrective Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>HPER 405—Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>HPER 465—Measurement and Evaluation in Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>HPER 470—Physiology of Exercise</td>
<td>3</td>
</tr>
</tbody>
</table>
EDUCATION—35

HEALTH, PHYSICAL EDUCATION AND RECREATION
(Continued)

*Major Field

*Minor Field

(62 credits) (40 credits)

For Women:

PER 223—Officiating Basketball 2 2

PER 302—Methods of Teaching P.E. 2 2

Secondary Level (or 303) 2 2

For Men:

PER 321—Dance Methods 6 6

Electives—Any Courses in PER 4 4

*Qualifies for K-12 certification endorsement.

*Prereq = Soc 101 (3 cr.)

**Placement in student teaching may not be possible; in this case provisional certification only will be available unless the student presents another teaching area in which student teaching can be accomplished.

HISTORY-POLITICAL SCIENCE

Major Field

Minor Field

(53 credits) (30 credits)

Hist 104-5-6—European Civilization 12 12

Hist 250-1—United States History 8 8

Pol Sci 251—American Government 10 10

Pol Sci 251—Intro to International Relations 5

Educ 428—Methods of Teaching Social Studies in Secondary Schools 3 3

Electives—Courses in History 15

*Must include at least 12 credits of upper division courses.

HOME ECONOMICS

Major Field

Minor Field

(64 credits) (40 credits)

H Ec 102—Personal and Family Living 3 3

H Ec 108—Home Management in Theory and Practice 3 3

H Ec 155—Textile Selection 2 2

H Ec 158—Intro to Clothing Problems 3 3

H Ec 158—Clothing Problems Laboratory 2 2

H Ec 210—Household Equipment 3 3

H Ec 241—Principles of Food Preparation 3 3

H Ec 241—Food Preparation Laboratory (or 242) 2 2

H Ec 246—Nutrition 3 3

H Ec 268—Child Development I 3 3

H Ec 302—Home Planning 3 3

H Ec 303—Interior Design and Furnishings 3 3

H Ec 305—Meal Management 3 3

H Ec 310—Family Finance 3 3

H Ec 310—Home Living Center 3 3

H Ec 346—Family Nutrition 3 3

H Ec 388—Advanced Clothing Problems 3 3

H Ec 397—Problems in Child Development 3 3

H Ec 421—Teaching Home Economics 3 3

H Ec 490—Seminar in Family Relationships 3 3

H Ec 492—Research Seminar 1

*Prereq = Chem 101 (4 cr.)

*Prereq = Psych 110 (5 cr.)

*Preq = Art 125 (2 cr.)

*ITALIAN

Major Field

Minor Field

(60 credits) (40 credits)

Ital 101-2—Elementary Italian 15 15

Ital 201—Intermediate Italian 12 12

Ital 301—Oral and Written Expression 8 8

Ital 303—Italian Civilization and Culture 6 6

Ital 311-2—Survey of Italian Literature 6 6

Ital 401—Applied Linguistics 3 3

Ital 492—Advanced Composition 3

†FL/Educ 390—Methods of Teaching Foreign Languages 3 3

Electives—Any Upper Division Italian Courses 3

*Foreign Language Department recommendation re student's proficiency is prerequisite to student teaching.

*Placement in student teaching may not be possible; in this case provisional certification only will be available unless the student presents another teaching area in which student teaching can be accomplished.

Credit will be allowed for exempted courses.

Minors may substitute 12 credits for a minor in another field.

*Must be taken in the junior year.

JOURNALISM—(Continued)

*Major Field

*Minor Field

(48 credits) (30 credits)

Jour 100—Social Role of Mass Media 3

Jour 150—Current Affairs 3

Jour 220—Elementary Photography 3

Jour 270—Reporting 3

Jour 290—History and Principles of Journalism 3

Jour—Educ 316—School Publications and Teaching Methods 3

Jour 360—Principles of Advertising 3

Jour 381—Advertising Sales 2

Jour 371—Advanced Reporting 3

Jour 372—Specialized Reporting 3

Jour 373.—News Editing 3

Jour 381—Advanced News Editing 3

Jour 390—Public Opinion 3

Jour 397—Law of Journalism 3

Jour 470—Reporting Public Affairs 3

Jour 471—Editorial Writing and Interpretation 3

Jour 498—Mass Media in Modern Society 3

TV 165—Introduction to Radio and Television 3 3

*All students preparing Major and Minor teaching fields in Music must demonstrate piano ability equivalent to 3 quarters of piano study (private or in class). Other Music courses may be substituted with the approval of the Chairman of the Music Department.

†Qualifies for K-12 certification endorsement.

JOURNALISM—Continued

Major Field

Minor Field

(48 credits) (30 credits)

Jour 101—3—Elementary Latin 15

Jour 111—3—Latin Readings 11

Jour 300—Major Latin Writers 22

*Major

Minor

Field

Field

(48 credits) (30 credits)

Lat 101-2-3—Elementary Latin 15 15

Lat 211-2-3—Latin Readings 11 11

Lat 300—Major Latin Writers 22 22

*Minor

Field

Field

(30 credits)

Educ 343—Organization and Administration of the School Library 3

Educ 344—Cataloging and Classification 3

Educ 345—Materials in Education and Pedagogy 3

Biblio 200—Library Reference and Research 3

Educ 346—Audiovisual Communication 3

Educ 442—Research Seminar in Education 3

Educ 443—Ideas and Trends 3

Educ 444—Advising A.V. Comm. Prog.—3 cr.

Eng 482—Lit. for High Sch. Tchr.—3 cr.

*LATIN

Major Field

Minor Field

(55-57 credits) (39-41 credits)

Math 101—Analytic Geometry and Calculus 10

10

Math 102—Analytic Geometry and Calculus II 10

10

Math 133—Linear Algebra 5

5

Math 240 or—Intuitive Geometry 5

5

Math 251—2—Calculation III and IV 10

10

Math 251—2—Calculation III and IV 10

10

Math 340—3—Mathematics for Teachers 9

9

Math 342—3—Introduction to Algebraic Structures 6

6


3


3

Electives—Selected from Math 381, 382, 387

3

Selected from Math 126, 241, 344, 347 3-5

2-5

*Major

Minor

Field

Field

(60 credits) (30 credits)

Mus 104—Performance Minor 3

3

Mus 111—3—Theory I 6

6

Mus 135—Introduction to Music Literature 4

4

Mus 136—Aural Perception I 4

4

Mus 201—4—Performance Major 7

7

Mus 211—3—Theory II 6

6

Mus 237—4—Aural Perception II 6

6

Mus 381—Conducting Methods and Materials 3

3

Mus 382—Conducting Methods and Materials 3

3

Mus 383—5—School Music 14

8

Mus 114—5—Piano in Class—3 cr.

Mus 117—6—Voice in Class—3 cr.

Mus 126—6—3—String Inst. Class—3 cr.

Mus 126—6—Woodwind, Brass, Percussion and Band—3 cr.

Mus 320—Piano Meth. & Mater.—3 cr.

(3 cr.

Mus 323—4—School Music—2 cr.

*Foreign Language Department recommendation re student's proficiency is prerequisite to student teaching.

*Credits will be allowed for exempted courses.

*Must include at least 12 credits of upper division courses.

MUSIC

Field

Field

(30 credits)

Liberal Arts and II 10

10

Latin Writers ---- 22

22

Societies ----- 3

3

Liberal Arts and II 10

10

Liberal Arts and II 10

10

Latin Writers ---- 22

22

Societies ----- 3

3

Liberal Arts and II 10

10

Liberal Arts and II 10

10

Latin Writers ---- 22

22

Societies ----- 3

3

Liberal Arts and II 10

10
**ENGLISH**

*PHYSICS

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 221-2-3—General Physics</td>
<td>15</td>
</tr>
<tr>
<td>Phys 231—Vector Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Phys 314—Electricity</td>
<td>3</td>
</tr>
<tr>
<td>Phys 325-4—Light</td>
<td>4</td>
</tr>
<tr>
<td>Phys-Educ 359—Methods of Teaching Physics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 341—Fundamentals of Modern Physics</td>
<td>5</td>
</tr>
<tr>
<td>Phys 371—Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Phys 441—Advanced Laboratory</td>
<td>2</td>
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<tr>
<td>Phys 480—Physics Seminar</td>
<td>5</td>
</tr>
</tbody>
</table>

*Prerequisites: Approximately 45 credits in Mathematics courses*

**PSYCHOLOGY**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psych 110—Introduction to Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psych 111—Introduction to Experimental Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psych 230—Child and Adolescent Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psych 240—Social Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psych 310—Sensory Process and Perception</td>
<td>5</td>
</tr>
<tr>
<td>Psych 311—Learning</td>
<td>5</td>
</tr>
<tr>
<td>Psych 361—Abnormal Psychology</td>
<td>5</td>
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</tbody>
</table>

*Placement in student teaching may not be possible: in this case provisional certification only will be available unless the student presents another teaching field in which student teaching can be accomplished.*

**RUSSIAN**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russ 101-2-3—Elementary Russian</td>
<td>15</td>
</tr>
<tr>
<td>Russ 201-2—Intermediate Russian</td>
<td>15</td>
</tr>
<tr>
<td>Russ 201—Applied Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>Russ 202—Russian Composition and Conversation</td>
<td>3</td>
</tr>
<tr>
<td>Russ 311-2-3—Survey of Russian Literature</td>
<td>9</td>
</tr>
<tr>
<td>FL-Educ 390—Methods of Teaching Foreign Languages</td>
<td>5</td>
</tr>
</tbody>
</table>

*Placement in student teaching may not be possible: in this case provisional certification only will be available unless the student presents another teaching field in which student teaching can be accomplished.*

**SOCIAL SCIENCES—BROAD FIELDS**

(Many)

Does not qualify for teaching Economics, Geography, or Sociology Major Field

| Econ 201-2-3—Principles of Economics | 9 | 9 |
| Geog 331—Political Geography | 3 | 3 |
| Geog 333—Cultural Geography | 3 | 3 |
| Hist 101—Introduction to History | 12 | 12 |
| Hist 201—United States History | 8 | 8 |
| Pol Sci 201—American Government | 12 | 12 |
| Soc 101—Introductory Sociology | 5 | 5 |

*Electives—Upper Division Courses in Anthropology, Economics, Geography, History, Political Science, Sociology |

**SOCIOLOGY**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 152—Man and His Culture (or 153)</td>
<td>5</td>
</tr>
<tr>
<td>Soc 101—Introductory Sociology</td>
<td>5</td>
</tr>
<tr>
<td>Soc 201—Social Science Methods</td>
<td>5</td>
</tr>
<tr>
<td>Soc 207—Introduction to Social Change</td>
<td>5</td>
</tr>
<tr>
<td>Soc 208—Individual and Society</td>
<td>5</td>
</tr>
<tr>
<td>Soc 307—Socialization</td>
<td>3</td>
</tr>
<tr>
<td>Soc 304—Introduction to Complex Organizations</td>
<td>4</td>
</tr>
<tr>
<td>Soc 310—Development of Social Thought</td>
<td>5</td>
</tr>
<tr>
<td>Educ 428—Methods of Teaching Social Studies in Secondary Schools</td>
<td>3</td>
</tr>
</tbody>
</table>

*Placement in student teaching may not be possible: in this case provisional certification only will be available unless the student presents another teaching field in which student teaching can be accomplished.*

**SPANISH**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span 101-2-3—Elementary Spanish</td>
<td>15</td>
</tr>
<tr>
<td>Span 201-2-3—Intermediate Spanish</td>
<td>15</td>
</tr>
<tr>
<td>Span 301-2—Oral and Written Expression</td>
<td>6</td>
</tr>
<tr>
<td>Span 302—Contemp. Hispanic Civilization and Culture</td>
<td>3</td>
</tr>
<tr>
<td>Span 311-2-3—Survey of Spanish Liter.</td>
<td>3</td>
</tr>
<tr>
<td>Span 410—Applied Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>Span 422—Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td>FL-Educ 390—Methods of Teaching Foreign Languages</td>
<td>3</td>
</tr>
</tbody>
</table>

*Placement in student teaching may not be possible: in this case provisional certification only will be available unless the student presents another teaching field in which student teaching can be accomplished.*

**SPEECH**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpCo 110—Introduction to Systems of Communication</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 112—Argumentation</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 222—Introduction to Communication: Phonology (or 119-9)</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 224—Introduction to Communication: Process</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 314—Discussion and Small Groups (or 371)</td>
<td>3</td>
</tr>
<tr>
<td>SPA 330—Introduction to Speech Pathology</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 333—General Semantics</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 335—Message Composition</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 361—Oral Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>SpCo-Educ 420—Teaching Speech in the Secondary School</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 430—Business and Professional Interviewing</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 441—Rhetorical Theory</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 445—History of American Public Address (or 446)</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 462—Directing the Forensic Program</td>
<td>3</td>
</tr>
</tbody>
</table>

**ENGLISH**

Students study English for a variety of reasons. Some have practical purposes: they realize the need for greater clearness, precision and ease in their use of English. Some are motivated by a general cultural interest: they hope, through a study of literature to clarify and enrich their knowledge of themselves and their world. Others combine cultural purposes with specific vocational or professional objectives, such as professional writing or teaching. Those who choose English as their major usually fall into one of three groups:

**SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN ENGLISH**

In addition to the general requirements for graduation listed earlier in the catalog, the student seeking the degree of Bachelor of Arts with a major in English must complete a minimum of 60 credits in the major but not more than 66 credits in the department. English 100 and 300 do not count toward the English major. The required courses are listed in the schedules given below. By the beginning of his junior year the student should have decided definitely which of the schedules he is to follow:

**SCHEDULE A:** Potential critics, scholars, and college teachers, who can increase their critical insight by study of the great literary works of the past and present, and can prepare themselves for graduate work by gaining an understanding of the methods and materials of literary study.

**SCHEDULE B:** Potential creative writers, whose powers can be tested and directed in an environment favorable to the development of their individual abilities in the writing of poems, short stories, novels, and plays.

**SCHEDULE C:** Prospective teachers in high school, who need a program which will provide them with an adequate background in their subject matter as well as required course work for secondary school certification.

---

*French Language Department recommendation re student's proficiency is prerequisite to student teaching.*

*Credit will be allowed for exempted courses.*

*Must be taken in the junior year.*

*Minors may substitute Span 462.*
Students who do not achieve acceptable scores on the English section of the ACT examination must take English 001, Preparatory Composition, and receive a “pass” grade before they may enter English 100. 300 or 450. The English Department reserves the right to ask a student to take a less advanced course if it is apparent that he cannot write at the level of a more advanced course.

Courses 300 and 450 are open to students with adequate ability in composition, regardless of their class level.

001 PREPARATORY COMPOSITION 3. A remedial course with emphasis on problems of basic mechanics (usage, punctuation, spelling, etc.), sentence structure, and simple organization. (Credit not allowed toward a degree.)

100 LOWER DIVISION COMPOSITION 3. A course designed to help students learn to write accurately and logically about the subjects they already understand.

300 UPPER DIVISION COMPOSITION 3. For the generally competent student writer already pursuing an academic major in the University. Emphasis upon those kinds of writing—such as reports, reviews, criticisms, informal essays and examinations—which are normal in academic competition among upper division students. (Junior standing not required to enter this course if the student is properly prepared.)

450 ADVANCED COMPOSITION 3. Concentration upon complex subjects and ideas, especially within a student's own professional area. (Senior standing is not required to enter this course if the student's ability in composition is adequate.)

CREATIVE WRITING

FOR UNDERGRADUATES

202 INTRODUCTION TO CREATIVE WRITING 3. Practice in creative writing at the introductory level.

301-302-303 CREATIVE WRITING: FICTION 3 prereq 202 or c/i. Enter any quarter.

306 THE WRITING OF DRAMA. (See Drama.)

313-314-315 CREATIVE WRITING: POETRY 3 prereq 202 or c/i. Enter any quarter.

FOR GRADUATES AND UNDERGRADUATES

401-402-403 ADVANCED CREATIVE WRITING: FICTION 3 prereq 301-302-303 and c/i. Enter any quarter.


440 TECHNIQUES OF MODERN FICTION 3. Intensive reading of several contemporary prose writers. Primarily for advanced students in creative writing, but open to all English majors.

441 TECHNIQUES OF MODERN POETRY 3. Intensive reading of several contemporary poets. Primarily for advanced students in creative writing, but open to all English majors.

442 TECHNIQUES OF MODERN DRAMA. (See Drama 491.)

495 INDEPENDENT STUDIES 3 R-9. Special projects in particular areas of literature and creative writing.

FOR GRADUATES

510 FICTION WORKSHOP V R-15 c/i

511 POETRY WORKSHOP V R-15 c/i

512 DRAMA WORKSHOP. (See Drama 541.)

699 THESIS V R-6 to 9.

LINGUISTICS

FOR UNDERGRADUATES AND GRADUATES

360 INTRODUCTION TO LINGUISTICS 3. An introduction to the science of modern linguistics and to the nature of language.

371 THE STRUCTURE OF MODERN ENGLISH 3. Phonological and grammatical structure from a modern linguistic point of view.

372 THE HISTORY OF THE ENGLISH LANGUAGE 3. The development of English phonology, grammar, and vocabulary from the Old English period to the present.

373 OLD ENGLISH 3. An introduction to the Old English language and literature.


496 THE TEACHING OF ENGLISH AS A FOREIGN LANGUAGE 3 prereq English 360 or 371 or c/i. The application of principles of modern linguistics to the problems of teaching English as a foreign language. Will include a contrastive study of English and at least one other language.

497 SEMINAR: PROBLEMS IN ENGLISH LINGUISTICS 3 prereq English 360 or 371 or c/i. Subjects vary: applications of linguistics, dialectology, stylistics, phonemics and morphemics, theories or grammar.
TEACHER TRAINING
FOR UNDERGRADUATES

482 LITERATURE FOR THE HIGH SCHOOL TEACHER 3.
Open to seniors only. The literature usually taught in grades 7 through 12 is covered with some indication of text selections.

FOR UNDERGRADUATES AND GRADUATES

302 METHODS OF TEACHING ENGLISH 3. Offered only during Spring Quarter. Juniors are expected to take it before practice teaching. Objectives, materials and organization of the curriculum from grade 7 to 12: observation of expert teachers; some practice in teaching and correcting of student themes. Does not count in schedule and B. Cr is not allowed for this course and the identical course Educ 382.

FOR GRADUATES

506 TEACHER TRAINING WORKSHOP V R-10 prereq teaching experience and c/l.

LITERATURE

FOR UNDERGRADUATES

101 INTRODUCTION TO THE READING OF LITERATURE 3.
Learning to read various types of literature for understanding and pleasure. (Not allowed toward a degree in English.)


200 APPLIED LITERARY CRITICISM 3. Limited to English majors and to students taking their first course in literary criticism. Survey of critical methods in literary criticism with selected examples of poetry, drama, and fiction.

211-212-213 INTRODUCTION TO MAJOR BRITISH WRITERS 3. Enter any quarter. A student with 9 credits of British Literature cannot take this course. (211) Chaucer through Milton. (212) Dryden through Keats. (213) Tennyson to the present.


FOR UNDERGRADUATES AND GRADUATES


334 THE SHORT STORY 3.

341 TUDOR AND JACOBEAN DRAMA 3 prereq 9 credits of Literature. Representative plays from Everyman through Ford and Shakespere, plus a few early plays of Shakespere.

342-343 SHAKESPEARE 3 prereq 9 credits of Literature. Enter any quarter. Intensive reading of three of Shakespere's plays, one of which will be Hamlet. Extensive reading of Shakespere's plays.

344 THEORIES OF DRAMA 3 prereq 1 quarter of 307-308-309. The critical literature from Aristotle to contemporary criticism and the theory of the development of representation plays from Aeschylus to the modern dramatists.

373 OLD ENGLISH 3. Phonological and grammatical structure, simple readings in the literature of the period. (See listing under Linguistics.)

396 BRITISH LITERATURE: SIXTEENTH CENTURY 3 prereq 9 credits of literature. May include both prose and poetry, but emphasis will be on the "new" poetry of Spenser, Sidney, Marlowe, and the nondramatic poetry of Shakespere.

398 BRITISH LITERATURE: SEVENTEENTH CENTURY. PROSE TO 1660 3 prereq 9 credits of literature. Restricted to metaphysical poetry beginning with Donne, and classical poetry beginning with Jonson, and their interrelationships as seen in poems like Carew and Marvell

399 BRITISH LITERATURE: RESTORATION 3 prereq 9 credits of literature. The major writers from 1660 to 1700 with emphasis upon Dryden.

390 BRITISH LITERATURE: EARLY EIGHTEENTH CENTURY 3 prereq 9 credits of literature. The major Neo-Augustan poets and prose writers, with emphasis upon Defoe, Swift and Pope.

391 BRITISH LITERATURE: LATE EIGHTEENTH CENTURY 3 prereq 9 credits of literature. The pre-Romantic poets and prose writers, with emphasis upon Gray, Johnson, and Fielding.

392 BRITISH LITERATURE: EARLY NINETEENTH CENTURY 3 prereq 9 credits of literature. Principal focus on the Romantic poets: Blake, Wordsworth, Coleridge, Shelley, Byron, Keats.

393 BRITISH LITERATURE: MIDDLE AND LATE NINETEENTH CENTURY 3 prereq 9 credits of literature. Major figures of the Victorian period: novelists (Dickens through Conrad), poets (Tennyson, Browning, Arnold, Hopkins), and essayists (Carlyle, Mill, Newman, Ruskin.)

395-396 BRITISH LITERATURE: TWENTIETH CENTURY 3 prereq 12 credits of literature. Enter either quarter. Major figures in prose and verse.

398 CONTEMPORARY LITERATURE 3 prereq 12 credits of literature. Representative British, American and continental writers.

400 ADVANCED LITERARY STUDIES 3 R-9 prereq 12 credits in Literature and c/l. Content varies.

411 MAJOR WRITERS 3 R prereq 12 credits of Literature. Study in depth of one of the world's major writers.

432-434-435 POETRY 3 prereq 9 credits of Literature. A chronological survey, with emphasis on close reading of representative works by major writers.

431 PROBLEMS IN AMERICAN LITERATURE 3 R-6 prereq 12 credits in Literature. Special genres, figures, and intellectual currents studied in depth.

435 BRITISH LITERATURE: MIDDLE ENGLISH (See listing under Linguistics.)

484 BRITISH LITERATURE: MEDIEVAL 3 prereq 12 credits of literature. Readings in the literature of the Middle Ages.

485 CHAUCER 3 prereq 12 credits of literature. The intensive study of Chaucer's major poetry in original Middle English.

486 MILTON 3 prereq 12 credits of literature. Study of Milton's poetry with some attention to significant prose pieces.


495 INDEPENDENT STUDIES 3 R-6. Special projects in particular areas of literature and creative writing.

FOR GRADUATES


504-505-506 SEMINAR: AMERICAN LITERATURE 3 R-12 prereq graduate standing. Enter either quarter. Studies in American Literature offered from various point of view: a period, a person, a genre.

600 SEMINAR: PROBLEMS IN RESEARCH 3. Guidance in graduate subject areas and research.

699 THESIS V R-6 to 9.

FOREIGN LANGUAGES

offers instruction in French, German, Greek, Italian, Latin, Romance Philology, Russian, and Spanish. The undergraduate courses have been planned to meet the needs of those who have begun the study of the language in high school as well as those who undertake such study for the first time in the university.

The courses in this department are intended to serve several purposes: (1) to contribute to the general education of students by giving them an opportunity to gain insight into patterns of living and thinking which are different from their own; (2) to enable students to gain proficiency in the language; (3) to prepare candidates for academic careers in research and college teaching by providing a solid basis for graduate studies in the various languages; (4) to prepare future teachers of foreign languages on the secondary level; (5) to give language training requisite to careers in government, foreign commerce, and library work; and (6) to enable students to read foreign publications and to meet graduate foreign language requirements in their field.

Two language laboratories with facilities for listening, oral practice, and recording are used to supplement regular class work, and are available to give the individual student opportunity to develop active use of the language.

The Department of Foreign Languages offers undergraduate majors in Classics, French, German, Italian, Latin,
Russian and Spanish. The Master of Arts degree is offered in French, German and Spanish.

HIGH SCHOOL PREPARATION. A student who has received credit for a foreign language in high school (but not in a college or university) and who wishes to continue that language at this University will enroll as follows: four years in high school, courses numbered 300 and above; three years in high school, 212 or 202; two years in high school, 211 or 201; one year in high school, 102, or if some time has intervened, 101.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN LANGUAGES. The total number of credits required for a major in a foreign language varies with the student’s high school preparation or language credit transferred from another college or university. Requirements for the teaching majors and minors are listed separately under Education. English 100 must be completed during the freshman year. It is strongly recommended, but not required, that English 300 also be completed.

RECOMMENDED BACKGROUND COURSES FOR FOREIGN LANGUAGE MAJORS. The Department of Foreign Languages strongly recommends that all foreign language majors take, as early as possible in their college career, the courses entitled Introduction to the Humanities (Humanities 151-152-153) and Classical Mythology (Humanities 160).

GRADUATE WORK. See Graduate School Bulletin.

CLASSICS

MAJOR REQUIREMENTS: Candidates for the Bachelor of Arts with a major in Classics will meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. Latin 101-213 inclusive or =
2. Greek 101-213 inclusive or =
3. At least 9 credits of Latin 300 (490) and 9 credits of Greek 300.
4. Also recommended for majors are: History 302, 303 and 304, or 201 and 202; General 151, 152, 153; Humanities 160; Philosophy 250.

GREEK

No major is given in Greek.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY GREEK 5.

211-212-213 GREEK READINGS 3 prereq 103.

FOR UNDERGRADUATES AND GRADUATES

300 MAJOR GREEK WRITERS 2 V 2-3 R 18 prereq 213.

LATIN

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor of Arts with a major in Latin must meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. Latin 101-213 inclusive or =
2. At least 22 credits of Latin 300 (490) (Greek 101-102 may be substituted for 4 credits of Latin 490.)
3. History 302 and 304 are also recommended for majors.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY LATIN 5.

211-212 LATIN READINGS 4 prereq 103 or =.

213 LATIN READINGS 3 prereq 212 or =.

FOR UNDERGRADUATES AND GRADUATES

300 (490) MAJOR LATIN WRITERS V 2-3 R 30 prereq 213.

FRENCH

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor of Arts with a major in French must meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. French 101 to 203 inclusive, or equivalent.
2. At least 27 credits of upper division work in French, which should include any four of the six period courses (321 to 333).
3. Five quarters, or equivalent, of another foreign language.
4. Two quarters in history of Europe, chosen from the following: History 215, 216, 309, 310, 311, 312, 313, 314, 315, 327, 328, 329. French 303 may be counted as one quarter of history, but if so, it may not also be counted as a French course.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY FRENCH 5.

201-202-203 INTERMEDIATE FRENCH 4 prereq 103 or =. Audio-lingual emphasis. For students who plan to obtain a major or minor in French, or for those particularly interested in the active skills. Credit not allowed for 201-202 and 211-212.

211-212 (213-215) FRENCH READINGS 4 prereq 103 or =. For students who do not plan to continue beyond the fifth quarter or who particularly want a reading knowledge. Credit not allowed for 211-212 and 201-202.

FOR UNDERGRADUATES AND GRADUATES

301 PHONETICS 3 prereq 203.

302 ORAL AND WRITTEN EXPRESSION 3 prereq 301 or c/l.

303 FRENCH CIVILIZATION AND CULTURE 3 prereq 302 or c/l.

312 (421) MEDIEVAL FRENCH LITERATURE 3 prereq 303.

322 (422) FRENCH RENAISSANCE 3 prereq 303.

323 (423) 17TH CENTURY FRENCH LITERATURE 3 prereq 303.

331 (431) 18TH CENTURY FRENCH LITERATURE 3 prereq 303.

332 (432) 19TH CENTURY FRENCH LITERATURE 3 prereq 303.

333 (433) CONTEMPORARY FRENCH LITERATURE 3 prereq 303.

400 GENRE STUDIES IN MEDIEVAL FRENCH LITERATURE 3 prereq 303.

401 APPLIED LINGUISTICS 3 prereq 302 or c/l. Specific problems in contrastive phonology, morphology, and syntax.

402 ADVANCED COMPOSITION 3 prereq 302 or c/l. Intensive practice in writing on different levels of usage and style.

410 THE SHORT STORY IN FRENCH LITERATURE 3 prereq 303.

420 TRENDS AND CURRENTS IN 17TH CENTURY FRENCH LITERATURE 3 prereq 303.

430 THE 18TH CENTURY FRENCH “PHILOSOPHIES” 3 prereq 303.

440 THE 19TH CENTURY FRENCH NOVEL 3 prereq 303.

450 CONTEMPORARY FRENCH POETRY 3 prereq 303.

460 HISTORY OF THE FRENCH LANGUAGE 3 prereq 303.

490 (491) SEMINAR 3 R-18 prereq 303. Studies in major authors, periods, or genres.

FOR GRADUATES

111-112 FRENCH FOR GRADUATE STUDENTS 4. Intensive reading course to prepare students to pass the reading examination required for advanced degrees. Does not carry graduate credit.

500 DIRECTED READINGS V 1-3 R-9. Prereq undergraduate major in French.

590 GRADUATE SEMINAR 3 R 9.


GERMAN

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor of Arts with a major in German must meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. German 101 to 203, or equivalent.
2. At least 27 credits of upper division work in German, which must include 311-312-313.
3. Five quarters, or equivalent, of another foreign language.
4. Two quarters in history of Europe, chosen from the following: History 215, 216, 309, 310, 311, 312, 313, 314, 315, 327, 328, 329. German 303 may be substituted for one quarter of history, but if so, may not be counted as a German course.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY GERMAN 5.

201-202-203 INTERMEDIATE GERMAN 4 prereq 103 or =. Audio-lingual emphasis. For students who plan to obtain a major or minor in German, or for those particularly interested in the active skills. Credit not allowed for 201-202 and 211-212.

211-212 (213-215) GERMAN READINGS 4 prereq 103 or =. For students who do not plan to continue beyond the fifth quarter or who particularly want a reading knowledge. Credit not allowed for 211-212 and 201-202.
FOR UNDERGRADUATES AND GRADUATES

301 ORAL AND WRITTEN EXPRESSION I 3 prereq 203. Emphasis on pronunciation and phonetics.

302 (300) ORAL AND WRITTEN EXPRESSION II 3 prereq 301 or c/i. Emphasis on active use of German.

303 GERMAN CIVILIZATION AND CULTURE 3 prereq 302 or c/i.

311-312-313 (201-202-203) SURVEY OF GERMAN LITERATURE 2 prereq 203. Enter any quarter.

401 APPLIED LINGUISTICS 3 prereq 302 or c/i. Specific problems in contrastive phonology, morphology, and syntax.

402 ADVANCED COMPOSITION 3 prereq 302 or c/i. Intensive practice in writing on different levels of usage and style.

421-422 DANTE'S DIVINA COMMEDIA 3 prereq 311-312-313, or coreq and c/i.

423-424 ITALIAN RENAISSANCE 3 prereq 311-312-313, or coreq and c/i.

432 17TH AND 18TH CENTURY ITALIAN LITERATURE 3 prereq 311-312-313, or coreq and c/i.

441 19TH CENTURY ITALIAN LITERATURE 3 prereq 311-312-313, or coreq and c/i.

442 20TH CENTURY ITALIAN LITERATURE 3 prereq 311-312-313, or coreq and c/i.

460 HISTORY OF THE ITALIAN LANGUAGE 3 prereq 311-312-313, or coreq and c/i.

490 SEMINAR 3 R-18 prereq 311-312-313. Major authors, periods, or genres.

PORTUGUESE

FOR UNDERGRADUATES

101-102-103 ELEMENTARY PORTUGUESE 5.

211-212 PORTUGUESE READINGS 4 prereq 103 or c/i.

ROMANCE PHILOLOGY

FOR UNDERGRADUATES AND GRADUATES

360 (375). INTRODUCTION TO ROMANCE PHILOLOGY 3 prereq 203 or 217 (Latin or a Romance Language). The development of the Romance languages from Latin to their present-day forms. (Required of all candidates for an advanced degree in any Romance Language.)

RUSSIAN

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor of Arts with a major in Russian must meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. Russian 101 to 203, inclusive, or equivalent.

2. At least 27 credits of upper division work in Russian, which must include 311-312-313.

3. Five quarters, or equivalent, of another foreign language.

4. Two quarters in history of Europe, chosen from the following: History 215, 216, 305, 324, 325, 226.

FOR GRADUATES

111-112 GERMAN FOR GRADUATE STUDENTS 4. Intensive reading course to prepare graduate students to pass the reading examination required for advanced degrees. Does not carry graduate credit.

500 DIRECTED READINGS 1-3 R-9 prereq undergraduate major in German.

590 GRADUATE SEMINAR 3 R-9.


HUMANITIES

160 (161) CLASSICAL MYTHOLOGY 2. Deities and myths of the Greeks and Romans, with emphasis on those of most importance to Western literature and art.

220 (221) FOREIGN LITERATURES IN TRANSLATION 2. Periods and literatures vary from quarter to quarter. No knowledge of foreign language necessary.

ITALIAN

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor or Arts with a major in Italian must meet the following requirements in addition to the general requirements for graduation listed earlier in the catalog.

1. Italian 101 to 203 inclusive, or equivalent.

2. At least 27 credits of upper division work in Italian, which must include 311-312-313. (Teaching majors may substitute the Teaching of Foreign Languages 390 for 3 credits of upper division Italian.)

3. Five quarters, or equivalent, of another foreign language.

4. Two quarters in history of Europe, chosen from the following: History 215, 216, 305, 310. Italian 303 may be substituted for one quarter of history, but if so may not also be counted as an Italian course.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY ITALIAN 5.

201-202-203 INTERMEDIATE ITALIAN 4 prereq 103 or c/i. Audio-lingual emphasis. For students who plan to obtain a major or minor in Italian, or for those particularly interested in the active skills. Credit not allowed for 203-205 and 211-212.

211-212 ITALIAN READINGS 4 prereq 103 or c/i. For students who do not plan to continue beyond the fifth quarter or who particularly want a reading knowledge. Credit not allowed for 211-212 and 201-202.

301 ORAL AND WRITTEN EXPRESSION I 3 prereq 203. Emphasis on pronunciation and phonetics.

302 ORAL AND WRITTEN EXPRESSION II 3 prereq 301 or c/i. Emphasis on active use of Italian.

303 ITALIAN CIVILIZATION AND CULTURE 3 prereq 302 or c/i.

311-312-313 SURVEY OF ITALIAN LITERATURE 2 prereq 203, Enter any quarter.

401 APPLIED LINGUISTICS 3 prereq 302 or c/i. Specific problems in contrastive phonology, morphology, and syntax.

402 ADVANCED COMPOSITION 3 prereq 302 or c/i. Intensive practice in writing on different levels of usage and style.

421-422 DANTE'S DIVINA COMMEDIA 3 prereq 311-312-313, or coreq and c/i.

423-424 ITALIAN RENAISSANCE 3 prereq 311-312-313, or coreq and c/i.

441 19TH CENTURY ITALIAN LITERATURE 3 prereq 311-312-313, or coreq and c/i.

442 20TH CENTURY ITALIAN LITERATURE 3 prereq 311-312-313, or coreq and c/i.

460 HISTORY OF THE ITALIAN LANGUAGE 3 prereq 311-312-313, or coreq and c/i.

490 SEMINAR 3 R-18 prereq 311-312-313. Major authors, periods, or genres.
FORESTRY—41

111-112 SPANISH FOR GRADUATE STUDENTS 4. Intensive reading course to prepare graduate students to pass the reading examination required for advanced degrees. (Does not carry graduate credit.)

500 DIRECTED READINGS 1-3 R-9.  
501-503 INTERMEDIATE SPANISH 4 prereq 103 or -.

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The University of Montana School of Forestry was founded in 1913, one of the original group accredited by the Society of American Foresters. It is currently one of 31 accredited schools in the nation.

HIGH SCHOOL PREPARATION. The student entering the School of Forestry should have a sound high-school background in English, mathematics, social studies, and the sciences. A minimum of one and one-half years of algebra and one year of geometry are desirable.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN FORESTRY. A minimum of 126 credits, with or without the physical education requirements. Three courses selected from English, Mathematics, Social Science, and the Sciences. The student must have a grade-point average of 2.5 or above to be admitted to the School of Forestry.

Special Expense Charges: all students enrolled in the School of Forestry or taking Forestry courses are assessed $15.00 per quarter for travel, laboratory materials and other instructional costs.

BACHELOR OF SCIENCE IN FORESTRY

This degree meets the professional requirement for foresters. There are three majors: forest resources management, forest science, and forest business.

CORE CURRICULUM

(Courses required of all majors in Forest Resources Management)

(First Year)

<table>
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<th>Course</th>
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<tr>
<td>Bot 111-114-115—General Botany</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Chem 101-102-106—General and Organic Chemistry</td>
<td>4 4 5</td>
</tr>
<tr>
<td>(or Chem 121-122-123—College Chemistry)</td>
<td>(5) (5) (5)</td>
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<tr>
<td>For 300—Survey of Forestry</td>
<td>3</td>
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<tr>
<td>Math 116-117—College Algebra, Trigonometry</td>
<td>5 5</td>
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<tr>
<td>Math 110, 150, 450—Forestry 220, Journalism 234, Speech Communication 111, 112, 113, 118.</td>
<td>5 5</td>
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<td>H &amp; PE 100</td>
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(Second Year)

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<tr>
<td>Bot 250—Basic Concepts of Ecology</td>
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<tr>
<td>Bot 260—Ecology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>Bot 325 (1)—Plant Physiology</td>
<td>5</td>
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<tr>
<td>Econ 201-202—Principles of Economics</td>
<td>3 3</td>
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<tr>
<td>Phys 111—General Physics</td>
<td>5</td>
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<tr>
<td>For 250—Forest Soils</td>
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<td>For 260—Forest Instruments</td>
<td>1 1</td>
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<tr>
<td>For 353—Land Survey Systems and Graphics</td>
<td>4</td>
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<tr>
<td>For 290-291—Dendrology</td>
<td>3</td>
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<td>Electives (2)</td>
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(Third Year)

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<th>Course</th>
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<tr>
<td>For 300—Forest Measurements</td>
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<td>For 200—Forest Biometry</td>
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<td>For 331—Aerial Photogrammetry</td>
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<td>For 310—Foundations of Silviculture</td>
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<td>For 295—Range Management</td>
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<td>Forest Protection (3)</td>
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<td>For 332—Wildlife Conservation</td>
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<td>For 383—Wildland Recreation Management</td>
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<td>For 322—Forest Products (4)</td>
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<td>For 322—Natural Resources Policy &amp; Administration</td>
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<td>For 325—Hydrologic Principles</td>
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<td>For 354—Transportation Systems</td>
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<td>Electives</td>
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(Fourth Year)

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<th>Course</th>
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<td>For 420-421—Forest Economics</td>
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<td>For 490-1—Integrated Forest Resources Management</td>
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<td>For 480—Senior Thesis</td>
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<td>For 401—Timber Management</td>
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<td>Electives</td>
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(1) Life or Physical Science Course may be substituted

(2) Social Science or Humanities or both

(3) Two courses in protection required, selected from fire, pathology, entomology

(4) One course required, selected from wood anatomy, wood chemistry, or forest industries.

MAJOR IN FOREST RESOURCES MANAGEMENT

This major is for students who are preparing for work in resource management, administration, and staff specialties. Every student with a major in forest resources management receives a broad basic education in Forestry, and in addition can select courses beyond the core curriculum to provide depth in one or more resource fields. The student will select his courses in consultation with his advisor and other faculty.

MAJOR IN FOREST SCIENCE

This major is for students who wish to prepare for graduate study in some specific area of forest science. It is open only to students who are approved by the Dean of the School of Forestry and maintain a grade-point average of 2.70 or above.

The curriculum is designed to meet the needs of the individual student and consists of courses chosen by the student with the counsel of his advisor and approval of the Forestry faculty.

MAJOR IN FOREST BUSINESS

This major is for students who are preparing for work in forest industries such as manufacturing, product development, marketing, sales, and other fields not primarily forest resource oriented.

The curriculum is designed to meet the needs of the individual student and consists of courses chosen by the student with the counsel of his advisor and approval of the faculty of the School of Forestry.

BACHELOR OF SCIENCE IN RESOURCE CONSERVATION

This degree meets professional requirements in selected natural resource fields allied to forestry. Major programs are offered in range, recreation, soil, water, and wildlife. There is no fixed core curriculum for the BSRC degree, although the first two years of study are almost identical in course content to those required for the BSF. In the third year, the student elects a specific area of study, with a specialized program worked out with the advisor and approved by the faculty.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Description (Index)

170 SURVEY OF WILDLIFE CAREERS 1 (1-0). (Also listed as Bot 170 and Zool 170).

190 SURVEY OF FORESTRY 2 (2-0). The field and subject matter of the forestry profession.

210 FOREST SOILS 4 (3-5) prereq Chem 101-102 or =. The chemical, physical, biological, and morphological characteristics of soils.

250 PRINCIPLES OF TECHNICAL EXPRESSION 2 (2-0). The criteria of good technical expression—clarity, directness, logical order, and terseness.

250 FOREST INSTRUMENTS 1 (0-3). The use, care and adjustment of instruments used in forest surveying and the field practices of forestry.

252 LAND SURVEY SYSTEMS AND GRAPHICS 4 (3-5) prereq 250, Math 117 or c/i. The history and subdivision of public land; measurements and legal aspects of property boundary lines and corners. Drafting techniques for maps, charts, contours and graphs.

290-291 DENDROLOGY 2 (1-3), 3 (2-5) prereq Bot 114, 115 or c/i. Identification, classification, silvical characteristics, range and economic importance of the principal forest trees of the United States and Canada. (290) The confiers. (291) The broadleaf trees.

300 FOREST MEASUREMENTS 4 (3-4) prereq 250, 252, Math 116, or c/i. The measurement, inventory, volume and growth determination of timber and other forest land resources.

309 FARM FORESTRY 3 (2-4) prereq c/i. The principles of forest management, silviculture and soils for small woodland holdings.

310 FOUNDATIONS OF SILVICULTURE 3 prereq Bot 251 or c/i. Forest site productivity, succession and stand development, species composition, manipulation of vegetation, effect of environment on race and species formation. Development of seed, germination, seedling and tree growth.

311 SILVICULTURAL METHODS 5 (4-4) prereq Bot 250, 251 or c/i. The production of forest crops including regeneration methods, nursery practices, intermediate cuttings and other cultural operations.

330 FOREST FIRE PLANS 3 (3-0) prereq junior standing and 330. Area pre-suppression planning and fire use planning. Action planning on project size fires.

357 TIMBER MECHANICS 3 (2-2). Elementary statics and strength of materials, with emphasis on wood as a structural material.

353 RANGE LIVESTOCK PRODUCTION 2 (2-0) prereq 360 and c/i. Selection, production, and management of range livestock.

FOR UNDERGRADUATES AND GRADUATES

301 FOREST BIOMETRICS 4 (3-5) prereq Math 116.

312 FOREST TREE IMPROVEMENT 3 (3-4) prereq 311. Plant breeding methods for genetically improved forest tree seed; quantitative genetics.

322 NATURAL RESOURCE POLICY 3 (3-0).

323 NATURAL RESOURCE ADMINISTRATION 3 (3-0).

330 FOREST FIRE MANAGEMENT 3 (3-0).
332 FOREST ENTOMOLOGY 3 (2-3) prereq Bot 250, 251 or c/i.
340 WOOD ANATOMY AND FUNDAMENTAL PROPERTIES 4 (3-3) prereq 290. Wood identification and anatomy; relationships of the physical, chemical and mechanical properties to specific uses.
341 CHEMICALLY DERIVED WOOD PRODUCTS 3 (3-0) prereq Chem 261 or equivalent and For 340.
342 WOOD ADHESIVES TECHNOLOGY 3 (3-0) prereq 340 and junior standing in the School of Forestry.
343 FOREST PRODUCTS AND INDUSTRIES 4 (3-4) prereq junior standing in the School of Forestry.
344 PREREQ 383.
347 ENVIRONMENTAL CONSERVATION 3 (3-0) prereq c/i.
348 WILDLIFE CONSERVATION 3 (3-0) prereq 360 and c/i.
350 TRANSPORTATION SYSTEMS 4 (4-0) prereq 232. Transportation planning and development in relation to resource use, with emphasis on conflicts of interest.
353 RANGE MANAGEMENT 4 (3-3)
354 RANGE FORAGE PLANTS 4 (0-6) prereq 360, Bot 268 and c/i.
355 RANGE ECOLOGY 3 (2-3) prereq Bot 250, 251.
356 WILDLIFE CONSERVATION 3 (3-0) prereq 360 and c/i.
357 ENVIRONMENTAL CONSERVATION 3 (3-0) prereq c/i.
358 WILDLAND RECREATION MANAGEMENT 3 (3-0).
358 RECREATION AREA PLANNING AND DESIGN 4 (3-4) prereq 353.
359 HYDROLOGIC PRINCIPLES 3 (2-4) prereq c/i.
360 CHEMISTRY OF PLANT CONSTITUENTS. (See Chem 380 and Bot 260.)
361 CHEMISTRY OF WOOD PRODUCTS. (See Chem 301.)
400 FOREST RESOURCE INVENTORY 4 (0-3) prereq 300, 301.
401 TIMBER MANAGEMENT 4 (4-0) prereq 311, 420, senior standing in Forestry.
410 FOREST RESOURCES FIELD TRIP 1-3 prereq upper division student and c/i. A joint faculty and student field trip for study and discussion of resource management and use.
411 SOIL CHEMISTRY 2 (2-0) prereq 210.
412 SOIL PHYSICS 2 (2-0) prereq 210.
413 FOREST REGIONS OF NORTH AMERICA 3 (3-0) prereq 310-311 or c/i. The ecological development of forest regions; current silvicultural problems and practices.
420-421 FOREST ECONOMICS 3 (3-0) (420) prereq Econ 202 or c/i.
422 ECONOMICS OF WILDLAND RECREATION MANAGEMENT 3 (3-0) prereq Econ 202 and c/i.
424 FOREST TAXATION SYSTEMS 3 (3-0) prereq 420, 421, or c/i.
425 INDUSTRIAL FORESTRY 3 (3-2) labs by arrangement) prereq 421 and 490 or c/i.
430 FOREST METEOROLOGY 4 (4-0).
431 BIOLOGY OF FOREST INSECTS 3 (3-0) prereq Zool 113. (See Zool 442.)
433 FOREST INSECT ECOLOGY 3 (2-3) prereq 432.
440 MECHANICALLY DERIVED WOOD PRODUCTS 3 (3-0) prereq junior standing in the School of Forestry.
441 SAWMILLING AND LUMBERING 3 (2-4) prereq junior standing in the School of Forestry.
442 WOOD SEASONING AND PRESERVATION 3 (3-0) prereq 300, 420, 421, or c/i. Industrial Forestry 3 (3-2) labs by arrangement) prereq 421 and 490 or c/i.
443 WOOD UTILIZATION FIELD TRIPS 3 prereq junior standing in the School of Forestry.
450 ADVANCED AERIAL PHOTOGRAMMETRY 3 (2-2) prereq 351 and c/i.
451 AERIAL REMOTE SENSING 3 (3-0) prereq 351 and c/i.
452 TIMBER HARVESTING 3 (3-0) prereq Econ 202.
454-455-456 FOREST ENGINEERING 3 (3-0) prereq 354, 454 Route planning, surveys, and design; physical and economic alternatives of route selection. (455) Contemporary problems of forest road development and use. (456) Specific problems in the transportation development of forest land areas.
458 MECHANICAL PROPERTIES OF WOOD 3 (1-4) prereq 340, 357.
460 RANGE ANALYSIS AND SURVEY TECHNIQUES 4 (2-6) prereq 360 and c/i.
461 RANGE LIVESTOCK NUTRITION 3 (2-5) prereq 360 and c/i.
463 RANGE ECONOMICS 3 (3-0) prereq 360, Econ 201 and c/i.
464 RANGE ADMINISTRATION 2 (2-4) prereq 360 and c/i.
465 REGIONAL RANGE MANAGEMENT 6 prereq 363, 460, 461 and c/i.
470 ADVANCED WILDLIFE CONSERVATION 5 (4-2) prereq Zool 368, 369 or c/i.
471 BIG GAME CONSERVATION 3 (2-field trips) prereq 360 or c/i.
472 WILDLIFE HABITAT CONSERVATION 5 (4-field trips) prereq 470 and c/i.
480-481-482 INTEGRATED FOREST RESOURCE MANAGEMENT 3 (3-0), 481 prereq senior standing. (481) prereq 480 or c/i. (482) prereq 471 or c/i.
483 PARK MANAGEMENT 3 (3-0) prereq 362, 385 and c/i.
485 WATERSHED MANAGEMENT 3 (2-4) prereq 365.
486 HYDROLOGY SEMINAR 2 (2-0) o/y prereq c/i. Regional, national, and international problems of water supply, transfer, and quality.
487 WATER USE AND DEVELOPMENT 2 (2-0) o/y. History of water use and policy development.
489 SOIL AND WATER CONSERVATION 4 (3-4) prereq c/i.
491-492-493 SENIOR WILDLIFE SEMINAR 1 prereq senior standing in Wildlife Biology or Forestry. See Zoology 491-492-493 and Botany 491-492-493.
495 FOREST ECOLOGY OF THE NON-TEMPERATE ZONES 2 (3-0).
496 FORESTRY AND ECONOMIC DEVELOPMENT 2 (2-6) prereq c/i.
497 WORLD RESOURCE PROBLEMS 2 (2-6) prereq c/i.
500 ADVANCED WILDLIFE MANAGEMENT 3 prereq 401, 420, 421 and 490.
501 ADVANCED FOREST MEASUREMENTS.
511 ADVANCED SILVICULTURE 3 (2-2) prereq 311 and c/i.
520 ADMINISTRATIVE LEADERSHIP Extension course V prereq undergraduate degree from a college or university of recognized standing. Intensive instruction in the fundamentals of sociology, psychology, speech, writing, business administration, public relations, and related fields. One month, 30 hours per week. Staff of university specialists in fields involved.
521 ADVANCED FOREST ECONOMICS 3 (3-0) prereq 310-311 or c/i. The ecological development of forest regions; current silvicultural problems and practices.
522 FOREST VALUATION 3 (3-0) prereq 421.
523 FOREST LAND RESOURCE ECONOMICS 3 (3-0) prereq 421.
524-525-526 RESOURCE POLICY AND ADMINISTRATION SEMINAR 3 prereq c/i. Guided individual study; preparation and presentation of seminar papers. (524) Scarcity vs. growth at the resource base. (525) Comprehensive and incremental decision making in resource administration. (526) Professional bureaucracies in natural resource administration.
530 FOREST FIRE BEHAVIOR 3 (3-0) prereq 330, 430. The forest fire as a three dimensional problem involving fuels, topography, weather and the influence of these on behavior of wild and prescribed fire. Emphasis is placed on high intensity fires and erratic fire behavior.
531 FOREST FIRE INFLUENCES 3 (3-0). The effects of wild and prescribed fire and its influence on plant succession, forest regeneration, and the microclimate of the forest.
542 WOOD RESIDUE UTILIZATION 4 (2-6) Prereq 341, 440, 441. Techniques for volumetric survey. Classification and product uses for various types with detailed emphasis on the type most pertinent to interests of student concerned.
543 WOOD PARTICLE BOARD—TECHNOLOGY AND PRACTICE 3 (1-6) prereq 342, 440, 441, 455.
551 ADVANCED AIR PHOTO ANALYSIS 3 (3-0) prereq 451, c/i.
560 ADVANCED RANGE MANAGEMENT 3 prereq 360 and 460.
GENERAL COURSES

are offered as surveys or introductions to broad fields of learning, but there is no "general course" in which a degree is offered. Any University student is compelled to study in many fields as a matter of general education; and specialization in one curriculum, although required for a degree is strictly limited (see Graduation Requirements). But it has been found advisable to provide certain degree-curricula which overlap two or more of the curricula described in other pages of the catalog and in which the specialized instruction is drawn from several fields. The curricula in Biology, Liberal Arts, Pre-Medical Science and Wildlife Biology are examples. It also has been found desirable to provide particular courses which overlap two or more fields; these are described below.

HUMANITIES

FOR UNDERGRADUATES

151-152-153 INTRODUCTION TO THE HUMANITIES 3. Enter any quarter. English majors who have completed 9 or more credits in literature may not receive credit in this course. A general survey of the field of Humanities through the centuries from the Greeks to Americans, with the primary aims of understanding and appreciation. (See Graduation Requirements.)

160 (151) CLASSICAL MYTHOLOGY. (See Foreign Languages.)

200 (221) FOREIGN LITERATURES IN TRANSLATION. (See Foreign Languages.)

269 A SEARCH FOR IDENTITY 3. Revisionism as manifested in the African past and in the conflicts faced by the American Negro from 1619 through the Civil War.

289 A SEARCH FOR IDENTITY 3. The American Negro from Reconstruction to the present day with specific emphasis on the development of the Black Power movement.

297 SOUL COMMUNITY 3. A critique and analysis of the Black writers, artists, and musicians in relation to the Black man’s search for identity.

341 THE FILM 3. An historical survey of the film with appreciation of techniques. (Given under auspices of the School of Journalism and the departments of English and Drama.)

351 STUDIES IN HUMANITIES 3 R-9 prereq Gen 151-152-153. Advanced studies in Humanities. Given by different instructors under various titles.

395 THE ANATOMY OF PERSONAL RELATIONSHIPS 3 prereq any two of the 200 level courses. A critical analysis of the roles of the races in light of their personal relationships with each other.

366 THE BLACK RENAISSANCE 3 prereq any two of the 200 level courses. A study of the urban setting with particular emphasis on the nature and purpose of community organization and the political, economic, educational, religious and cultural phenomena of the urban setting which reveal the racist character of our society.

398 THE ROLE AND DEVELOPMENT OF HISTORICAL BLACK PERSONALITIES 3 R-9 prereq any two of General 260, 266, 297. Individual personalities and their effect upon the civil rights movement in America. (Frederick Douglass, W. E. B. DuBois, Booker T. Washington, Malcolm X, Marcus Garvey, Martin Luther King, Jr., and Toussaint L’Ouverture.)

FOR UNDERGRADUATES AND GRADUATES

440 STUDIES IN COMPARATIVE LITERATURE 3. The origins and dissemination of important literary ideas, trends, and movements.

451 SEMINAR IN THE HUMANITIES 3 R-9 prereq Humanities 351 or c/l. Specialized topics or areas such as Chinese and Japanese literature. Taught by various instructors from departments in the Humanities Group. Topics announced in class schedules.

SCIENCE

FOR UNDERGRADUATES

110 THE USE AND ABUSE OF DRUGS 3. The nature of drugs: their history, development and normal use in the treatment of disease. Drug dependence and abuse and the special classes and types of drugs involved. (Not open to pharmacy majors.)

125-126-127 SCIENCE FOR ELEMENTARY TEACHERS 5 (4-2). Open only to majors in Elementary Education. (125) A survey of the fundamental aspects of physical science, including force and motion, electricity, magnetism, wave motion, gravity, heat, states of matter, the universe, geological processes, atomic structure, and related topics. (126) An investigation of the interrelationships of physical and biological sciences: the elements, chemical reactions, basic organic chemistry, biochemistry, metabolism, cell structure, relationship of cell structure and function, cell division, basic genetics, origin of life, and related topics. (127) A survey of the animal and plant kingdoms, including taxonomy, morphology, physiology, life cycles, ecology, evolution, and related topics.

131 INTRODUCTION TO BIOLOGICAL SCIENCE 4 (3-2). The basic principles of biology, including aspects of cytology, cellular metabolism and genetics. Primarily for students not majoring in Botany, Microbiology or Zoology. Credit not allowed for this course and Botany or Zoology 111.

132 EVOLUTION, GENETICS AND MAN 3 prereq Gen 131 or —. Evolution, especially as related to man and including evidence, mechanisms, genetics, nature of hereditary material and adaptation. Not counted toward a major in Botany, Microbiology or Zoology.

FOR UNDERGRADUATES AND GRADUATES

300 CONSERVATION OF NATURAL AND HUMAN RESOURCES IN MONTANA 3 prereq c/l. A critical survey of climate, physiography, mineral resources, soil and water, as related to plant and animal production and human well being under development of principles underlying improved management of the natural resources. A study of the human and cultural resources. The methods of social implementation of desired practices. Primarily a teacher training course. Does not satisfy requirements for degrees in Botany or Zoology or the group requirements in science.

322 METHODS OF TEACHING BIOLOGY 3 (2-4) prereq senior or graduate standing. Designed to familiarize prospective high school biology teachers with texts, demonstrations and laboratory experiments used in contemporary approaches to teaching of biology.
GEOGRAPHY

is concerned with understanding the earth and man. An interest in the place-to-place variations of both men and their terrestrial environment is basic, but the overriding objective of the study of Geography is an understanding of the physical and social processes that influence or use of the world.

Geographers investigate the processes of human use and change of the earth. Such research requires knowledge of climates, vegetative cover, soils, landforms as a fundamental background, which, combined with studies in the disciplines of the Social Sciences, may be used to understand comparative cultural histories, economic changes, resource use patterns, or other areal differentiation of earth systems. Such studies fall under the broad category of human geography. Interests in the more strictly environmental aspects of the surface processes operating on the earth, such as in geomorphology, meteorology, climatology, and biogeography, are considered physical geography.

The undergraduate major in Geography offers the student an opportunity to receive a broad liberal education designed to develop a spatial perspective on the human occupation of the earth and an awareness of the diversity of man and environment in an evolving world. Although undergraduate training in Geography does not provide a set of standardized, highly marketable skills, challenging opportunities for employment exist in industry, government, and the teaching professions at all levels.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN GEOGRAPHY. In addition to the general requirements for graduation listed earlier in the catalog, a 2.5 average on 75 credits in the geography major is required. These 75 credits are distributed as follows: (1) 45 credits in geography, including geography 101 and 102, two courses in physical geography; two courses in cultural geography, a regional course and one technique course; (2) 27 credits in science and social science, including 9 and 18 or 16 and 9 credits respectively selected from a department in two major areas: anthropology, economics, history, political science or sociology (social sciences); and biological sciences, chemistry, geology, mathematics or physics and astronomy (science). Course sequences in other areas might be arranged between the student and the geography department; (3) English Composition 100, 3 credits. Students with obvious deficiency in composition, apparent from written work handed in, will be required to pass English Composition 102, 3 credits. The geomorphic regions of the continent

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101 PHYSICAL ELEMENTS OF GEOGRAPHY 5. The earth and planetary relations, maps, climate, vegetation, and landforms.

102 INTRODUCTORY HUMAN GEOGRAPHY 5. Cultural features of the world's landscapes in relation to human occupation of the earth.

300 GEOGRAPHY OF NORTH AMERICA 3 prereq 101 or =. Cultural areas of Canada and the United States with emphasis on differences in regional development.
GEOLOGY

Geologists study the earth, interpreting the processes and events which have made it what it is. They apply the results of all other scientific disciplines to this end. Insights recently gained have brought geology to a state of scientific revolution fully comparable to that brought to physics a few years ago by the discovery of radioactivity.

Geologists concern themselves with problems as diverse as origin of ocean basins, movement of continents, the discovery of the identity of the constituents of the moon, the structure of the moon, the structure of the moon, the structure of the moon. Geology, in summary, concerns itself with the history of the earth as derived from the principles of geologic time and the processes of the earth that shape the earth landscape.

The Department of Geology offers bachelors, masters and doctoral degrees as well as a bachelor's degree in education with a major in earth science. All degree programs in the department involve some field work and a combination of applied and theoretical approaches. The department strongly recommends that persons wishing to enter professional employment in geology plan to get a graduate degree.

HIGH SCHOOL PREPARATION. In addition to the general requirements for University admission, it is recommended that high school preparation include as much mathematics and science as possible.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN GEOLOGY. In addition to the general requirements for graduation listed earlier in the catalog, the department requires the following courses.

1. Mathematics 116, 117, 118 or 121, 118 (recommended before 102).
2. Physics sequence; one course in Computer Science.
3. English composition 245, or 261, or 371; Two quarter beginning sequence in Biology.
4. One course in Microbiology or Genetics.

Attention is called to the fact that the requirements for the major can usually be completed by April 1.

FIELD TRIP EXPENSES. Students should go to the Department of Geology office for a statement of expenses connected with field trips. Trips from Blacks Hills to Yellowstone and from Whitehall to Glacier Park, Montana.

SUMMARY OF REQUIREMENTS

2. Geology course requirements 50
3. Other departmental requirements (Math 15 crs.; Chem. 20 crs.; Physics 15 crs.; Biol. 10 crs.; Eng. 9 crs.; and one course in Computer Sci. 1 cr.) 70
4. Health, Physical Education and Recreation 3
5. Electives (preferably outside of Geology) 25
Total 195
6. Geology Summer Field camp (between Fr-Soph yrs.) 10
GRADUATE WORK. See Graduate School Bulletin.
425-426 PETROGRAPHY/PETROLOGY 5 (2-6) prereq 315, 420.


432 SEDIMENTATION 4 (3-2) prereq 102 or 110, 315. Interpretation of depositional environments using both sedimentary structures and thin section shape analysis; labs include statistical techniques and field trips.

440 INTRODUCTION TO GEOPHYSICS 3 (3-0) prereq Physics 115, or 223, Math 118 or concurrent registration, Geol 331. Theory of commonly used geophysical methods, industrial methods, magneto, seismometric, seismological, electric and radiometric: emphasis on the interrelationships of geophysical anomalies and geologic structure. Geophysical case histories.

445 X-RAY DIFFRACTION AND SPECTROGRAPHIC ANALYSIS 4 (2-1) prereq 312. Theory of x-rays, their use in identification of polycrystalline materials; qualitative and quantitative chemical analysis by x-ray techniques; petrologic application.


465-466 VERTEBRATE PALEONTOLOGY 4 (2-4) prereq 408 or Zool 304 or = (465) Taxonomy, morphology and phylogeny of mammals. Nature and evolution of the mammalian history and paleoecology.

470 (510) ADVANCED GEOTECTONICS 3 (3-0) prereq 331. Analysis, synthesis of regional structural features including geosynclines, mountain belts, arcs, compressional mountain systems, structure of plateau and broad warps. Conditions within earth; possible causes of deformation.

475 GLACIAL AND PLEISTOCENE GEOLOGY 3 (3-0) prereq 102. Glacial and Pleistocene geology emphasizing development of last 3 million years. Paleo-ice conditions of Quarterfjord, glaciological, glaciological deposits, and features.

480 HYDROGEOLOGY 3 (3-0) prereq 310. Occurrence and distribution of surface and ground waters on earth's crust. Actions of flowing water, and development and evolution of reservoirs.

490 SENIOR SEMINAR V prereq upper class standing in geology or comparable background in related areas and c/i.

TEACHER EDUCATION COURSES

300 GEOLOGY FOR NATURAL SCIENCE TEACHERS Su 4 (3-2) prereq 203, 331. Teaching physical geology including minerals, rocks, erosion by streams and glaciers, action of volcanoes, origin of earthquakes. Includes field trips. Not allowed toward a degree in geology. Credit not allowed for 101-102 or 110 and 300.

301 GEOLOGY AND MINERAL RESOURCES OF MONTANA Su 3 (2-3) prereq 500 and c/i. Geology and evolution of Montana and adjacent areas through the last two billion years. Metal and non-metallic deposits in and near Montana. Field trips. Not allowed toward a degree in geology.

302 FIELD GEOLOGY FOR NATURAL SCIENCE TEACHERS Su 3 (1-3) prereq 301, 408, and permission of instructor. Geologic structures, landforms, and selected mineral deposits. Aerial photographs and topographic maps required as a prerequisite. Five days of on-campus instruction, ten days in the field during evening discussion periods. Not allowed toward a degree in geology.

306 METHODS OF TEACHING EARTH SCIENCE 3 (2-4) prereq 203 or 210. Contemporary texts, demonstration techniques, laboratory experiments, and field procedures needed in developing an earth science curriculum. (Not allowed toward a degree in geology. Course does not satisfy group requirements. Taught by School of Education.)

FOR GRADUATES

507 CARBONATE PETROLOGY 4 (2-4) prereq 420. Description, classification and environmental interpretation of carbonate rocks chiefly Mississippian to Cenozoic in age.

511-512 METALLIC MINERAL DEPOSITS 4 (2-2) prereq 203, 315, 331. Theoretical and descriptive aspects of nature, origin, classification and geologic environments of metallic mineral deposits; field trips.

513 NON-METALLIC MINERAL DEPOSITS AND COAL 4 (3-2) prereq 203, 315, 331. Descriptive and theoretical aspects of origin, distribution, and classification of non-metallic mineral deposits; field trips, a copy of approved and bound thesis.

520 PETROGENESIS 3 (3-0) prereq 426 and 428. Advanced discussion of modern theories of origin of igneous and metamorphic rocks.

525 STRUCTURAL ANALYSIS 3 (3-2) prereq 315, 331. Study and interpretation of the fabric of naturally deformed rocks. Analysis of tectonites on all scales, including geologic map, hand specimen and thin section.

533 PHYSICAL PROPERTIES OF MINERALS 3 (3-0) prereq 315, math 311, physics 223. Physical and chemical properties of minerals and their genetic implications.

540 ADVANCED STRATIGRAPHY 3 (3-2) prereq 130, 331, 410-411. Advanced discussion of modern concepts concerning stratified rocks.

550 PRINCIPLES OF SEISMOLOGY 3 (3-2) prereq 440, Math 311, Physics 472. Elementary elastic wave theory; Analysis of stress and strain, equations of motion, surface and body waves, refraction and reflection, geophysical applications. Applications to earth physics and ecology.

554 GRAVITY AND MAGNETISM 4 (3-2) prereq 440, Math 311, Physics 222. Theory, instrumentation, field procedures and interpretational methods used for study of earth's gravity, magnetic field. Applications to geologic problems. Field problems near Missoula.

590 SEMINAR V prereq graduate standing in geology or comparable background; discussion of modern geology. Topics: Environmental problems, theoretical aspects of geomorphology, chemistry of ore fluids, structure of mineral deposits, electrical fields and heat flows, exploration techniques, rock mechanics, terrestrial impact features, crystal growth, co-existing minerals. Emphasis on advanced petrologic considerations included in both quarters.

595 ADVANCED PROBLEMS V. Investigations of geologic problems exclusive of thesis research.

600 RESEARCH V. Directed research to serve as thesis for graduate degrees.

600 THESIS V R-15. Credit assigned upon submission of final copy of approved and bound thesis.

HEALTH, PHYSICAL EDUCATION AND RECREATION deals primarily with muscular activity and recreation to provide the individual with wholesome psycho-motor and organic development, with fitness for daily living, and with resources for use of leisure. The program provides (1) instruction in a wide variety of sports and recreation skills, (2) opportunity for student groups to organize teams and to participate in formal and informal competition, in such activities as archery, badminton, basketball, bowling, golf, horses, skiing, swimming, tennis, touch football, softball and volleyball, and (3) preparation for professional careers in the various fields related to physical education and recreation.

The department offers Bachelor of Science and Bachelor of Arts degrees with a major in Health, Physical Education or Recreation; Master of Arts and Master of Science degrees in Physical Education or Recreation, and Master of Arts and Master of Science for Teachers of Physical Education.

Theory courses include structure and function of the human body, basic principles and teaching procedures, history and philosophy, and planning and administration of programs. Professional activity courses include training in teaching team games, individual and dual sports, gymnastics and tumbling, aquatics, and forms of the dance. Students interested in physical therapy and orthopedic rehabilitation may fulfill entrance requirements for approved schools of physical therapy. Also available is an area of emphasis for athletic trainers. Health education includes personal as well as school and community problems and the contributions of various agencies to human health and welfare. Recreation courses offer preparation and practice in group leadership, training in crafts and related skills for leaders of youth groups, and background for careers in industrial and community recreation and in recreation therapy. All levels of American Red Cross certification are offered in conjunction with swimming and first aid courses.

Many graduates enter the teaching and coaching professions, choose to continue graduate studies with specialization in physical education, administration of physical education and athletics, the dance, physical therapy, or recreation therapy. Others become field directors for the American Red Cross in the areas of first aid, life saving and water safety, or may elect careers in leadership positions in youth-serving organizations in playground and recreation centers, in summer camps, in the armed forces, in industrial recreation, and in recreation in hospitals and rehabilitation centers.
48—HEALTH, PHYSICAL EDUCATION AND RECREATION

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HEALTH AND PHYSICAL EDUCATION. Two degrees are offered in this Department: Bachelor of Arts, which requires that foreign language requirement listed in the catalog be satisfied, and Bachelor of Science, which requires no course in foreign language. Students electing either degree will fulfill the requirements listed below. Upper division students are expected to maintain a cumulative grade-point average of at least 2.0 in order to continue as majors in the department.

To remain enrolled in Professional Activities 110-120 and 215-220, students must meet the minimum departmental proficiency level in both skill and knowledge of the area of specialization from which courses may be allowed for a demonstrated high level of proficiency.

English 100 and 300 are required. Students scoring below the 17th percentile on the ACT English examination, must first successfully complete English 901. Those above the 90th percentile will be exempt from either English 100 or 300.

General Education (67 crs.): Group I to include Zoöl 111 and 202, Mich 102, Group II to include Chem 101, or Physics 101. English 100, 101, 160; Group III to include Soc 101, Group IV Electives. In addition English 100, 300, Home Ec 146, Psych 110 and 230, Speech Comm 111, and HPER 115-120 (3 crs. fulfills the HPER requirement). Pre-physical therapy students see area of specialization below.

Teacher certification: Course requirements in Education to meet teacher certifications are listed under Education in this catalog. Certification is approved for K-12 grades.

Professional Physical Education: Required of all students in any of the areas of specialization listed below. Dance majors: HPER 105-200, 215-220, 290, 301 (not dance), 305, 365, 384 (380-385), 395, 405, 486 (not dance), 478.

AREAS OF SPECIALIZATION (student selects one area for specialization study):

Physical Education, Men: Required (29 crs.): HPER 240, 234, 339, 358, 373, 375, 386, 466; Elect HPER 8 crs.

Physical Education, Women: Required (29 crs.): HPER 232, 240, 301, 302, 303, 324, 383, 375, 376; Elect HPER 7 crs.

Coaching: Required (29 crs.): HPER 210, 211, 240, 310, 311, 321, plus 2 coaching courses: Elect HPER 6 crs.

Dance: Required (37 crs.): HPER 202, 234, 235, 236, 324, 325, 327, 329, 401, 402, 423; Drama 123 (Drama 123); Electives.

Health: Required (36 crs.): HPER 339, 373, 375, 386, 470, 486; Mich 100, 101; Phar 110; Electives.

PRE PHYSICAL THERAPY

Many therapy schools require a "C+" minimum grade point average of applicants. Courses in biological and physical sciences must be "C" or better for acceptance by a number of these schools.

General Education (93 crs.): Group I to include Zoöl 111, 113, 202, Mich 102; Group II to include Chem 101, 102, Math 116, 117, Physics 111; Group III to include Soc 101, 102, Group IV Electives. In addition English 100, 300, Home Ec 146, Psych 110 and 361, Comm 111, Speech Path 390 and HPER 115-120 (3 crs. fulfills degree requirement).

Professional Physical Education: (19 crs.): HPER 290, 384, (380-385), 396, 466, 478.

Area of Specialization: (28 crs.): HPER 240, 236, 387, 388, 390, 399 (2 quarters), 460, 486, 575.

ATHLETIC TRAINING-ADAPTIVE PHYSICAL EDUCATION (166 crs.)

General Education (78 crs.): Group I to include Zoöl 111, 202, Mich 102; Group II to include Chem 101, 102, 160; Group III to include Soc 101; Group IV Electives. English 100, 300, Home Ec 146, Psych 110, 388, 410, 411 (9 crs.), 486, 575, 3 crs. in additional coaching courses.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN RECREATION. Two degrees are offered: Bachelor of Arts with major in Recreation which requires the foreign language requirement listed in the catalog be satisfied, and Bachelor of Science which requires no course in foreign language. Students electing either degree will fulfill the requirements listed below. Upper division students are expected to maintain a cumulative grade-point average of at least 2.0 in order to continue as majors in the department.

General Education (85 crs.): Group I to include Zoöl 111, 202, Mich 102; Group II Electives; Group III to include Soc 101, 102, 202, 290; Group IV Electives. English 100, 300, Psych 110, 230, SpCo 311, 314.

General Professional Preparation (17 crs.): HPER 115-120 (3 crs. fulfills HPER requirement) and HPER 199, 240, 301, 303, 339, 465, 490.


Requirements from other Departments (30 crs.): Educ 347; For 363, 386; Jour 270; SW 181; Art (4 crs. required) 125, 125, 129, 127, 129; Drama (4 crs. required) 121, 374, 377; Music 134.

Electives: 35 crs. of which no more than 20 crs. may be from HPER.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index).

100 PHYSICAL EDUCATION—3 quarters (3 credits) required of all students except those exempt for cause. Only one credit per quarter or per term of summer session may be used to meet the requirement. No activity may be repeated to meet the 3 quarter requirement. Beginning level in activity courses may not be repeated for credit. Students may elect to be graded on pass/fail basis.

105 CONCEPTS OF PHYSICAL EDUCATION 1. 115-120 PROFESSIONAL ACTIVITIES FOR MAJORS AND MINORS 1. Six quarters required of all HPER majors and minors. 3 quarters substitute for 3 quarters HPER 100 requirements. All students required to meet proficiency standards set by Department.


Women (115) Soccer, Speed Ball. (116) Modern Dance. (117) Soft Ball. (118) Volley Ball, Speed Ball. (119) Gym (120) Track.

199 FIRST AID 2. Red Cross Standard and Advanced courses and Medical Self-Help. Certification secured upon completion of course.

200 (190, 198) HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION 3.

208 ADVANCED COACHING TECHNIQUES 1.

210 COACHING OF FOOTBALL 3.

211 (211, 212) THEORY OF OFFICIATING FOOTBALL 1.

213 COACHING GYMNASICS AND TUMBLING 3 prereq 119 (Men), 119 (Women), and c/l.

214 COACHING OF WRESTLING 3 prereq c/l.

215-220 PROFESSIONAL ACTIVITIES FOR MAJORS AND MINORS 1-8. All students required to meet proficiency standards set by department.

223 (200) COACHING OF BASEBALL 3.

225 RECREATION SPORTS OFFICIATING, THEORY AND PRACTICE 3.

232 OFFICIATING BASKETBALL (WOMEN) 2.

234 DANCE HISTORY 3.


236 THEORY AND PHILOSOPHY OF DANCE 2.

239 WATER SAFETY INSTRUCTOR 2 prereq Red Cross Senior Life Saving Certificate. Red Cross Instructor’s Certificate awarded upon successful completion of requirements, providing student has reached his 18th birthday.

240 CARE AND PREVENTION OF ATHLETIC INJURIES 3.

250 SKI INSTRUCTORS QUALIFICATION PROGRAM 3. Pre-req c/l. Open to all students with above average skiing ability. Techniques of Teaching Skiing including finished technical forms, teaching methods, ski school progression, and ski mechanics. Prepares the potential ski instructor for certification by the Professional Ski Instructors of America.

261 (361) INTRODUCTION TO RECREATION 3 prereq Soc 101. Social significance of recreation and leisure; community approach to recreation. Principles and practice concerned with leadership of recreation programs.

290 HUMAN ANATOMY 5. The systems of the body and the structure of organs composing these systems.

301-302-303 METHODS OF TEACHING PHYSICAL EDUCATION ON THE SECONDARY LEVEL 2 prereq 6 credits from 115-120 and/or 215-220. Experience in teaching: class organization, analysis of techniques, development of units of instruction in seasonal sports.

305 PROBLEMS IN PHYSICAL EDUCATION 1.

310 COACHING OF BASKETBALL (MEN) 3.

311 (311, 312) THEORY OF OFFICIATING BASKETBALL (MEN) 2.

312 (321, 322) COACHING OF TRACK 3.

322 COACHING OF COMPETITIVE SWIMMING 3 prereq c/l.

324 METHODS AND MATERIALS IN BALLOON, FOLK AND SQUARE DANCE 4 prereq 220.

325 METHODS OF TEACHING MODERN DANCE 2 prereq 116 (Women).

AQUATIC PROGRAM MANAGEMENT 3 prereq Senior Life Saving or =. Methods of teaching swimming for various age groups. Swimming pool and waterfront management.

TEACHING PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS 3 prereq PE majors and minors, junior standing, PE 200 and 6 credits in 115-120; elementary education majors, junior standing and EDU 202. Principles and foundations of school physical education, theory and practice in selecting and teaching activities for children in grades one through six.

PROGRAMMING IN RECREATION 3. Principles of program planning for organized offerings in recreation. Selection, adaptation and evaluation of activities.

CAMP COUNSELOR 3. Qualifications and professional preparation for camp counselors.


RECREATION LEADERSHIP (SOCIAL RECREATION) 3 prereq Soc 101. Principles and practice in group leadership, program skills for various age groups and for special groups, such as the handicapped.

RECREATION LEADERSHIP (CAMP LEADERSHIP) 3 prereq Soc 101. Principles and practice in group leadership of outing activities; skills and understandings essential to organized camping.

FIELD WORK IN RECREATION 2, Su V R-8. Supervisory and leadership experiences, methods and techniques to be used in conducting recreation programs in outdoor recreation, community social agency and institutional situations. Laboratory given in various settings. Activities are coordinated to outdoor activities of the season and group activities available for leadership training.

ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION 3 prereq 200.

METHODS IN TEACHING HEALTH 3

INTRODUCTION TO PHYSICAL THERAPY 3 prereq or coreq 386. Theory and practice of massage. The treatment of defects which occur within the field of physical education.

CLINICAL TRAINING IN PHYSICAL THERAPY V 1-4 R-4 prereq 386 and c/i. Practical experience in local physical therapy centers.

FIRST AID 3. Red Cross Standard, Advanced and Instructor’s Course and Medic Self-Help. Certification at Instructor level upon completion of course.

SENIOR SEMINAR 1.

FOR UNDERGRADUATES AND GRADUATES

ADVANCED TECHNIQUES IN MODERN DANCE 2 prereq Modern Dance 1 and II.


THE HIGH SCHOOL INTRAMURAL PROGRAM 2.

THE SCHOOL HEALTH PROGRAM 3. Appraisal, preventive and remedial aspects of school health program.

APPLIED ANATOMY AND KINESIOLOGY 5 prereq 290.

PREVENTIVE AND CORRECTIVE PHYSICAL EDUCATION 3 prereq 280. Prevention and detection of common physical defects frequently encountered by the physical educator; follow-up programs possible under medical supervision.

MASSAGE 3 prereq Zool 202, HPER 384.

AMBULATORY TECHNIQUES FOR THE ORTHOPEDICALLY DISABLED 2 prereq 344.

DANCE COMPOSITION AND IMPROVISATION 3 prereq Modern Dance 1 and II.

DANCE PRODUCTION 3 prereq 401. Choreography, staging, lighting, makeup, costume and other problems of dance in public performance including concert dance and dance demonstrations. Performance in dance concert required.

ADVANCED TECHNIQUES IN ATHLETIC TRAINING 3 prereq HPER 240, 384, Zool 202, Chem 160.

PRACTICUM IN ATHLETIC TRAINING 3 R-9 prereq HPER 410 or concurrent registration.

RECREATIONAL AREAS AND FACILITIES 3. The planning, construction and maintenance of urban oriented recreation areas and facilities as they relate to organized activities in public and private parks, playgrounds, play areas, all-purpose and specific use camps and day camps. Methods and techniques for financing. Tax programs and possibilities.

SEMINAR V 1-3 R-12.
HISTORY

is the study of man over the time span of the past, both as an individual and as a member of a group. For the student in search of a broad basis of education rather than in training for some particular occupation, the department offers a program of instruction designed to provide a knowledge and understanding of the background and ramifications of the present local, national, and world affairs. Many students combine the fields of History and Political Science.

The department helps to prepare men and women occupationally for either the domestic or the foreign service of the federal government and for positions in state and local government. It teaches professionals the values of critical thinking and research, and furnishes them with a basis for the pursuit of their chosen profession, but also furnishes knowledge and perspective for intelligent leadership in community affairs.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HISTORY. In addition to the general requirements for graduation listed earlier in the catalog the following special requirements must be completed for the Bachelor of Arts degree with a major in History. A minimum of 60 credits in History is required with 40 credits from courses numbered over 300 and including History 301, 302, and 303. The student must elect the minimum of 40 upper division credits for the B.A. History major and must select a minimum of 20 credits in American and 20 credits in European History plus 5 credits in another area (Asia, Canada, Latin America, Africa). The departmental English composition requirement (English 101, 102, or 103) must be completed.

A student may offer a combined major in History and Political Science with 60 credits, of which at least 20 credits must be in History and 20 credits in Political Science. The remaining credits must be selected from courses numbered over 300. The departmental English composition requirement must be completed.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

104-105-106 EUROPEAN CIVILIZATION 4. Enter any quarter. (104) Classical Antiquity to 1450. (105) 1450-1815. (106) 1815 to present. (Credit is given for 104 and former 201-202-203, nor for 105-106 and former 101-102-103.)

215-216 EUROPE IN THE 19TH CENTURY 3 enter either quarter. (215) The internal political, economic and social development of the European states from 1816-1870. (216) continuation after 1870 to 215.


261-262-263 UNITED STATES HISTORY 4. Enter either quarter. (261) The American nation from its colonial beginnings to the end of the Civil War. (262) Continuation to the present.

285-286-287 HISPANIC-AMERICAN HISTORY 3. Enter any quarter. (285) The Iberian background; Conquest and Colonization; (286) The American nation from its colonial beginnings to institutional development to graduation listed earlier in the catalog the following special require­ments must be completed for the Bachelor of Arts degree with a

301 ANCIENT NEAR EAST 3. Pre-Greek civilizations of Meso­potamia, Asia Minor and Egypt.

302 (303) ANCIENT GREECE 3. Greek culture during the period of the city-states and the Age of Alexander the Great.

303 THE HELLENISTIC AGE 3. The Ptolemaic, Antigonid, Seleucid and lesser states successor to the Alexandrian Empire and their social, political and economic development to the time of their absorption by Rome.

304 (305) ANCIENT ROME 3. Early Ituran civilization; Rome as part of Hellenistic culture. (305) The Roman Republic, the Principate and the Empire.

305 BYZANTINE HISTORY 3. Origins and development of the civilization of the Eastern Roman Empire to 1453. Relations with Persians, Arabs, Slavs and Turks; cultural and political influence upon the West.

306 THE EXPANSION OF EUROPE 3. Exploration and coloni­zation of the non-European world in the sixteenth, seventeenth, and eighteenth centuries; relations of Europe with Asia, Africa, and America.

307 THE RENAISSANCE 3. The idea of the Renaissance applied to economic, political and cultural developments in Western Europe from 1300 to 1500; the impact of this idea on later historiography.

310 THE REFORMATION 3. The impact of the Reformation on European society, politics, economic theory and religious thought from 1500 to 1660.

311-312-313 EARLY MODERN EUROPE 3 Enter any quarter. (311) The political, economic, intellectual, and social development of Europe from 1450 to 1599. (312) 1599 to 1648. (313) 1648 to 1700.

314-315 FRENCH REVOLUTION AND NAPOLEONIC ERA 3 prereq 101 or 312. Enter any quarter. (314) The French Revolution to 1795. (315) The Directory, the rise of Napoleon, the First Empire, and the Napoleonic Wars.


319 CONTEMPORARY EUROPEAN HISTORY 4 prereq 102. The internal affairs and the external relationships of the principal European states since 1933.

320 MEDIEVAL GERMANY 911-1250 3. The Frankish experiment. Emergence and development of Germany under the Saxon, Salian, and Hohenstaufen dynasties with special emphasis on constitutional growth.

321-322 CENTRAL EUROPE 4 prereq 101. (321) The development of the states of Central Europe from early modern times to 1815. (322) Continuation to the present.

324-325-326 HISTORY OF RUSSIA 3. (324) The beginnings of Russia to 1613. (325) Russia from 1613 to 1825. (326) Russia in revolu­tion: 1825 to present.

327-328-329 MODERN FRANCE 3 enter any quarter. (327) The political, economic, and social development of France from 1815 to 1871. (328) From 1871 to 1914. (329) From 1914 to 1950.


334 MODERN WAR AND WESTERN SOCIETY 3 prereq a col­lege course in modern European history. A history of warfare from the French Revolution. Emphasis is placed upon relationships of government and military command, upon problems of strategy, and upon theories of war.

335 THE BRITISH EMPIRE 4 prereq 101 or 242. English explora­tions and colonization. The First British Empire. Developments in the nineteenth and twentieth centuries. The Empire today.

336-337-338 THE MEDIEVAL WORLD 3 enter any quarter. (336) Political, religious, and economic changes in the West and in Europe from the reign of Diocletian to the disintegration of the Roman Empire. Continuation of the departmental English composition requirement (English 101, 102, or 103) must be completed.

339 HISTORY OF CANADA 4 prereq 101, 242 or 261. Canada to the present time, with emphasis upon Canadian-American diplo­matic and economic relations; the growth of the Canadian West.


344-345-346 ECONOMIC HISTORY OF EUROPE 3 prereq 4 quarters of Economics. Enter any quarter. (344) The growth of the economies of ancient and medieval Europe to 1500. (345) Euro­pean economic growth from 1500 to 1850. (346) Continuation since 1850.

351-352 COLONIAL AMERICA 3. (351) The transfer of English civilization to America in the seventeenth century with attention to the qualities that supported permanent and particular settlements. (352) American civilization from 1689 to the end of the Seven Years War, with focus upon the political, social and economic maturing that prepared the colonies for the revolution era.


359 RECENT UNITED STATES, 1892 TO PRESENT 3. The Great Depression and New Deal; World War II; the Cold War and after.


363-364 HISTORICAL ORIENTATIONS 3. Enter any quarter. (363) Selected perspectives, ideas, and values from historical research. (364) The historical perspective in both American and European history: structure, methods and principles of historical research.
485 THE GILDED AGE 3. American history 1877-1901: the politics of complacency; the agrarian revolt; triumphalist industrialism; emergence of the United States as a world power.

486 EARLY 20TH CENTURY UNITED STATES, 1900-1929 3. The Progressive era of reform: intervention in World War I; the "Roarin' 20's" and the Great Crash.

461-462-463 AMERICAN INTELLECTUAL HISTORY 3. Enter any quarter. (461) The formation of the American mind, emphasizing Whigs and Jackson Democrats, and the three phases of rivalry between modern Republicans and Democrats.

483-484 LATIN AMERICAN INTELLECTUAL HISTORY 3. Enter either quarter. (483) Colonial Latin American intellectual history. Interaction between intellectual and political, economic, and social milieus through the publication of José Enrique Rodo's Ariel in Latin America after Independence. (484) Latin American intellectual movements in the 20th century. The intellectual as political activist.

487-488 HISTORY OF CHINA 3 preq 379-380-381. (487) Imperial China from earliest times to 1500. (488) China and the West, 1500 to the present.

464 EUROPEAN HISTORICAL THOUGHT 2 preq 25 cr. in History. The contributions of leading 19th-century European historians to the development of modern historical analysis and interpretation.

492 PROBLEMS IN AMERICAN HISTORIOGRAPHY 2 preq 25 cr. in History. Study of the contrasts in historical interpretation by various historians and problems of the reconstruction of the past in the contemporary time.

493 (391) PROBLEMS IN HISTORY V R-9 preq 25 cr. in History with "B" average. Study or research in fields selected according to the needs and objectives of the individual student.

494 HONORS COLLOQUIUM IN HISTORY 1-3 R-20 c/l.

495 (395) SPECIAL STUDIES IN HISTORY 2-3 R-20 c/l. Offered by different instructors under various titles.

FOR GRADUATES

510 READINGS IN HISTORY 2-4 R-20. Independent study and directed research.

531 FIELD COURSE IN AMERICAN COLONIAL HISTORY 3-5. Intensive reading in American colonial history.

533 FIELD COURSE IN THE CIVIL WAR 3-5. Intensive reading in Western American history.

534 FIELD COURSE IN THE CIVIL WAR 3-5. Intensive reading in the history of the American Civil War.

535 FIELD COURSE IN MODERN AMERICA SINCE 1877 3-5. Intensive reading in American history since Reconstruction.

536 FIELD COURSE IN AMERICAN ECONOMIC HISTORY 3-5. Intensive reading in American economic development in the nineteenth and twentieth centuries.

538 FIELD COURSE IN AMERICAN BUSINESS HISTORY 3-5. Intensive reading in the history of American business in the nineteenth and twentieth centuries.

537 FIELD COURSE IN THE AMERICAN REVOLUTION 3-5. Intensive reading.

538 FIELD COURSE IN EARLY NATIONAL AMERICAN HISTORY, 1789-1848 3-5. Intensive reading.

539 FIELD COURSE IN AMERICAN DIPLOMATIC HISTORY 3-5.

540 FIELD COURSE IN AMERICAN CONSTITUTIONAL HISTORY 3-5.

541 FIELD COURSE IN MEDIEVAL EUROPE 3-5. Intensive reading in the history of the Middle Ages from the fifth to the fifteenth centuries.

542 FIELD COURSE IN MODERN ENGLAND 3-5 Intensive reading in British history since 1485.

543 FIELD COURSE IN MODERN GERMANY 3-5. Intensive reading in the history of Germany since 1500.
HOME ECONOMICS

curricula are designed to provide a well rounded educational program which will not only prepare the individual for more effective living in the home and community but also for a professional career. The program assures each student an opportunity for a basic liberal education in addition to meeting professional requirements.

Opportunities for graduates are many and varied. Home Economics at the University of Montana prepares students for positions in the areas of education, extension, dietetics and institution administration, research, business, government and community services, and industry.

There are 4 general plans available to the undergraduate major. Plan 1 provides a secondary school teaching certification including the Montana Vocational Education requirements. Plan 2 prepares one for work in the area of Foods & Nutrition, including institutional management and meets the American Dietetic Association's requirements for Dietetic Internship. Plan 3 prepares one for Nursery School teaching. Plan 4 is a program in general Home Economics and the student may choose to emphasize either Clothing & Textiles or Family Relations. The general major may be combined with other offerings on the campus such as Business, Radio and TV, Psychology, Social Welfare and others. A student may earn either a Bachelor of Arts degree or a Bachelor of Science degree with a major in Home Economics.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HOME ECONOMICS. A minimum of 50 credits in Home Economics selected as follows:

1. Required for all majors: Home Economics 109, 155, 241, 246, 265, 309; one course in English composition and one in speech communication.

2. Preparation for Teaching: Home Economics 102, 157, 158 (or 258), 210, 242 (or 245), 202, 203, 306, 310, 358, 367, 421, 490 (421 may be taken in either Education or Home Economics); Art 125; Chemistry 101: Microbiology 100, 101, 206; requirements in education to meet certification with a teaching major or minor in home economics are listed under education.


4. General Home Economics: Home Economics 102, 157, 210, 358, 202, 303, 304, 305, 490. Students select option (a) or (b) according to interests.

(a) Clothing and Textiles emphasis: Home Economics 264, 252, 358, 359, 360, 406; Art 125, 200, 201, 100; Chemistry 101. Students should satisfy the foreign language requirement. Those planning a career in clothing should take Economics 201, 202, 203; Business Administration 360, 362.

(b) Family Relations emphasis: General Home Economics requirements plus Home Economics 310, 346, 367, 490; Anthropology 158; Chemistry 101; Sociology 200, 294, 306; 6 credits of Social Welfare; Psychology 230, 240.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

102 PERSONAL AND FAMILY LIVING 3 (3-0). Personal development and factors which affect family and social relationships.

105 GENERAL HOME ECONOMICS 1 (0-2). Selected subjects in Home Economics. Offered by various instructors under different titles.

109 HOME MANAGEMENT IN THEORY AND PRACTICE 2 (2-0). Resources used in daily living; principles of resource use; managing in an environment to obtain satisfaction for individuals and families.

141 ELEMENTARY FOODS 3 (2-2). The selection, storage, preparation and serving of food. Non-majors and non-minors only.

146 ELEMENTARY NUTRITION 3 (3-0). Fundamental principles of adequate human nutrition. Non-majors and non-minors only.

155 TEXTILE SELECTION 3 (2-2). Fabrics for family clothing and home furnishings. Analysis of fibers, yarns, weaves and finishes.

157 INTRODUCTORY CLOTHING PROBLEMS 3 (3-0). Aesthetic and economic factors in the selection of clothing. Principles of clothing construction.

158 CLOTHING PROBLEMS LABORATORY 2 (4-4) prereq or coreq 157. Basic principles applied to planning and making garments. (For the student who is lacking in experience in clothing construction.)

210 HOUSEHOLD EQUIPMENT 3 (3-0) prereq 109. Principles of operation, materials specifications, selection, care and use of equipment.

241 (141) PRINCIPLES OF FOOD PREPARATION 3 (3-0). The selection, storage, and preparation of food. Methods of food conservation. Majors and minors only. Credit not allowed for both 241 and 242.

242 FOOD PREPARATION LAB 2 (4-4) prereq or coreq 241. Basic principles applied to food preparation. (For the student who is lacking in experience in food preparation.)

246 NUTRITION 3 (3-0) prereq Chem 101. Nutrition given in the light of the chemistry and physiology of digestion.

258 EXPERIMENTAL CLOTHING 2 (0-4) prereq 157. Working with new fabrics using a variety of construction and fitting techniques.

264 WEAVING 2 (0-4) prereq Art 125. Basic weaving techniques with emphasis on creativity.

265 CHILD DEVELOPMENT I 3 (3-0) prereq Psych 110. Prenatal through age 6.

266 CHILD DEVELOPMENT II 3 (3-0) prereq Psych 110. The child from 6-14 years.

302 HOME PLANNING 3 (2-2) prereq 210 and Art 125. Physical and aesthetic considerations in planning and selecting a home.

303 INTERIOR DESIGN AND FURNISHINGS 5 (4-2) prereq 202. Art principles applied to Interior Decoration to create attractive, efficient background for living. A study of outstanding period styles, contemporary designs and designers, plus qualities to consider in selecting home furnishings.

304 FAMILY HOUSING 3 (3-0) open to non-majors. Housing in relation to needs of various types of families and to the family life cycle.

305 MEAL MANAGEMENT 3 (3-4) prereq 109, 210, 241, 246. Nutritional and social aspects of family meals, with emphasis on time, energy, money, and equipment management.

309 FAMILY FINANCE 5 (5-0) open to non-majors. Individual and family finance with emphasis upon financial planning, savings, insurance, investments, and use of credit.

310 HOME LIVING CENTER 3 prereq 109, 210, 241, 246, 305, 309. Residence in the home living center for unmarried students; special problems of managing the home for married students.

331 (431) QUANTITY FOOD PRODUCTION V 2-4 (1-4) prereq 210. Application of principles of food preparation and food management to institutional situations. Menu planning for institutions.
FOR UNDERGRADUATES AND GRADUATES

342 EXPERIMENTAL FOODS 3 (1-4) prereq 241. Foods from the experimental point of view. Special problems are assigned for individual investigation.

346 FAMILY NUTRITION 3 (3-0) prereq 246 or c/i, non-majors c/i. The science of nutrition as it applies to the growth, development, and maintenance of health in all age groups.

352 HISTORY OF CLOTHING AND TEXTILES 3 (3-0). Historic costumes and textiles and their influences on modern dress and fabrics.

356 ADVANCED CLOTHING PROBLEMS 3 (1-4) prereq 157 or c/i. Modern principles used in the construction of tailored garments. Experimentation with a variety of techniques and fabrics.

359 CLOTHING DESIGN 3 (2-2) prereq 157 and Art 125. Art principles applied to designing clothing. Original designs created through flat pattern and draping methods.

360. RECENT DEVELOPMENTS IN TEXTILES 3 (2-2) prereq 155. Developments in fibers and finishes, legislation, and standardization. Comparison and evaluation of textiles.

367 ADVANCED PROBLEMS IN CHILD DEVELOPMENT 3 (1-4) prereq 265. Participation in the laboratory.

370 TEACHING IN THE NURSERY SCHOOL 5 (0-10) prereq 265, 266. (For nursery school teaching majors only.)

396 NUTRITION IN DISEASE 3 (3-0) prereq 246. The symptoms of diseases, prophylaxis and feeding in disease.

421 TEACHING HOME ECONOMICS 5 (4-2). Preparation for teaching Home Economics in secondary schools. (Home Economics majors may take this course as Educ 458.)

423 LARGE QUANTITY BUYING 3 (3-0) prereq 331. Selection, purchase and storage of foods for institutions.

433 INSTITUTION ORGANIZATION AND MANAGEMENT 3 (3-0) prereq 432. Efficient organization and administration of food service units, employment and personnel procedures, personnel schedules, records, food cost, and maintenance.

446 ADVANCED NUTRITION 3 prereq Chem 481 or concurrent enrollment. Readings and discussion of nutritional research.

458 READINGS IN CLOTHING 3 (3-0). The social and psychological aspects of clothing.

490 (501) SEMINAR IN HOME ECONOMICS V 1-3 R-12.

499 PROBLEMS IN HOME ECONOMICS V R-12. Qualified students may select for study special problems in any of the major fields in Home Economics. Offered by various instructors under different titles.

FOR GRADUATES

699 THESIS V R-15.

JOURNALISM

Courses examine the news media—emphasizing their history, privileges and responsibilities—and provide instruction in skills required for careers with newspapers, radio and television stations, magazines, public relations departments, news services and related agencies. About one-fourth of the work for the B.A. in journalism is taken in the School of Journalism. Three-fourths of the total credits required for graduation provide a background in the liberal arts, stressing history, government, economics, philosophy, literature, foreign languages, psychology and sociology.

Undergraduates specialize in one of four sequences: news-editorial, radio-television, advertising or magazines.

Many graduates obtain positions on newspapers in Montana and other states. Some are foreign correspondents. Several are editors and publishers. Others hold positions with news services, radio-television stations, technical magazines, public relations firms, advertising agencies and government departments. Several are distinguished scholars, authors and teachers.

A Master of Arts in Journalism is offered (see Graduate School).

Course requirements in Education to meet teacher certification with a teaching major or minor in Journalism are listed under Education in this catalog.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, study of a foreign language and typing is recommended.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN JOURNALISM. In addition to the general requirements the candidate for the degree of Bachelor of Arts in Journalism must complete the recommended core curriculum of 22 hours, plus the requirements of his sequence, plus upper class electives to make a total minimum of 48 hours in Journalism. The core curriculum in Journalism, required of all majors, consists of Journalism 100, 150, 270, 290, 327, 371, 279, 390, 351, 491-492-493. A foreign language is required (see FOREIGN LANGUAGE REQUIREMENT in general section of catalog).

CURRICULUM IN JOURNALISM

Freshman Year

Journ 100—Social Role of the Mass Media ................ Cr.
Journ 150—Elements of Writing .................. 3
HPER 100 (3 quarters)—Health, Physical Education and Recreation .................. 3 (2-2)
Additional courses to meet University requirements .......... 36-46

Sophomore Year

Journ 270—Reporting .................. 3
Journ 290—History and Principles of Journalism .................. 3
Additional courses to meet University requirements .......... 39-50

Junior and Senior Years

Journ 360—Principles of Advertising .................. 3
Journ 361—Advertising Sales .................. 3
Journ 371—Advanced Reporting .................. 2
Journ 372—Specialized Reporting .................. 2
Journ 380—News Editing .................. 3
Journ 381—Advanced News Editing .................. 2
Journ 491-492-493—Senior Seminar .................. 6
Journ Electives (including sequence requirements) .... 15-35
Additional Electives .................. 67-29

Total recommended hours in Journalism ........ 195
Total recommended hours in General Education .......... 147

JOURNALISM CURRICULUM

NEWS-EDITORIAL SEQUENCE: Additional 9 hours required to be chosen from Journalism 357, 390, 570, 490. 

ADVERTISING SEQUENCE: An additional 9 hours required to be chosen from Radio-Television 346; Journalism 360, 365, 364.

MAGAZINE SEQUENCE: An additional 9 hours required to be chosen from Journalism 327, 332, 333, 334.

RADIO-TELEVISION SEQUENCE: An additional 9 hours required to be chosen from Radio-Television 341-342-343, 346, 348.

NOTE: Students wishing to major primarily in radio or television journalism should take the radio-television sequence in Journalism. The School of Journalism also offers a curriculum leading to a Bachelor of Arts degree in Radio-Television (see Radio-Television).

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 SOCIAL ROLE OF MASS MEDIA 3. Open to non-majors.

150 ELEMENTS OF WRITING 3.

190 CURRENT AFFAIRS 1. Open to non-majors.

227 ELEMENTARY PHOTOGRAPHY 3 prereq c/i. Open to non-majors.

270 REPORTING 3. Open to non-majors.

290 HISTORY AND PRINCIPLES OF JOURNALISM 3. Open to non-majors.

297 NEWS PHOTOGRAPHY 3 prereq 227.

322 MAGAZINE MAKEUP AND EDITING 3 prereq c/i. Open to non-majors.

331 MAGAZINE ARTICLE WRITING 3 prereq c/i. Open to non-majors.

334 TRADE AND TECHNICAL WRITING 3 prereq c/i. Open to non-majors.

333 PROMOTION AND PUBLIC RELATIONS 3 prereq c/i. Open to non-majors.
The Supreme Court of Montana admits graduates to practice without examination. Most graduates become practicing attorneys. Others enter government service, business, or finance, with or without additional studies in these latter fields. Some take advanced or more specialized studies (such as law school) at eastern institutions, and the requisite scholarship standing are readily accepted by other law schools specializing in more advanced legal education. They are also to be found in the ranks of leading practitioners in many large cities of the United States.

### CALENDAR

#### FALL SEMESTER 1970

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 21-22</td>
<td>Orientation of new law students</td>
</tr>
<tr>
<td>September 22</td>
<td>Registration</td>
</tr>
<tr>
<td>September 29, Wednesday</td>
<td>Classes begin at 8:00 a.m.</td>
</tr>
<tr>
<td>November 11</td>
<td>Thanksgiving</td>
</tr>
<tr>
<td>November 30</td>
<td>Classes resume at 9:00 a.m.</td>
</tr>
<tr>
<td>December 19</td>
<td>Christmas vacation begins after last class</td>
</tr>
<tr>
<td>January 4, 1971</td>
<td>Classes resume at 8:00 a.m.</td>
</tr>
<tr>
<td>January 23 through January 30, Monday through Saturday</td>
<td>Semester examinations</td>
</tr>
</tbody>
</table>

#### SPRING SEMESTER 1971

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 10, Wednesday</td>
<td>Registration</td>
</tr>
<tr>
<td>February 11, Thursday</td>
<td>Classes begin at 8:00 a.m.</td>
</tr>
<tr>
<td>March 29, Saturday</td>
<td>Summer vacation begins after last class</td>
</tr>
<tr>
<td>May 31 through June 5, Monday through Saturday</td>
<td>Semester examinations</td>
</tr>
<tr>
<td>June 6, Sunday</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

### GENERAL STATEMENT:
The Law School is accredited by the American Bar Association of American Law Schools. Organization of instruction is upon the semester basis, the school being divided into two semesters of approximately eighteen weeks each, including vacation periods. For detailed information concerning facilities, descriptions of courses, and miscellaneous administrative regulations the applicant should consult the Law School Bulletin.

### REQUIREMENTS FOR ADMISSION:
The Law faculty passes on all applications for admission to the Law School. Candidates must be of good moral character and intellectual promise who have received a baccalaureate degree or its equivalent from an approved college or university. Applicants prior to the first year of the graduate program must have completed a course in American history. The law work previously undertaken has been in an approved law school; (2) that the average in all law work for which the student has registered and received a grade is equivalent to that required for graduation from the institution attended; (3) that the applicant is in good moral character and intellectual promise who have received a baccalaureate degree or its equivalent from an approved college or university.

### FOR GRADUATES

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEORIES OF COMMUNICATION 3: 3 prereq consent of the dean.</td>
</tr>
<tr>
<td>METHODS OF JOURNALISM RESEARCH 3: prereq consent of the dean.</td>
</tr>
<tr>
<td>RESEARCH IN JOURNALISM V: prereq consent of the dean.</td>
</tr>
<tr>
<td>THESIS V R-15.</td>
</tr>
</tbody>
</table>

### LAW

is the study of the official rules and regulations under which people live in organized American society; of the methods by which such rules are devised and applied; of the part that lawyers, judges, and public officials play in the application of such rules; and of the specialized techniques, practices, and procedures involved.

Law studies primarily involve preparation and class recitations and lectures on the basis of illustrative court opinions collected in course "casebooks." Special attention is also given to practice court work, in which the students are required to prepare and try cases as well as argue appeals. There is also training in the use of law books and in legal writing. The curriculum is designed to afford preparation for practice anywhere in the United States, but attention is also given to the law of Montana.
standing and eligible to continue in the law school previously attended; and (4) that the applicant is eligible to continue in this Law School under the policies specified herein. An applicant is not likely to be accepted unless he has a very high scholastic average in the law work previously taken and is exceptionally qualified to pursue the study of law.

**BASIS FOR EXCLUSION:** (1) Failures: A student who has failed more than ten credits shall be excluded from the Law School. Any student who has completed two semesters of law study but thereafter fails two courses in any semester shall be excluded from the Law School. (2) Weighted Average: A student whose law school record is deficient more than five (5) grade points at the end of his second or third semester shall be excluded. A student who fails to obtain an index of 2.0 at the end of his fourth semester of law study in all law courses for which he has registered and received a grade, or fails to maintain such an index thereafter shall be excluded from the Law School.

Any required course in which a student has received an F grade shall be repeated. No other course may be repeated. The grade received on the repeated course will not replace the prior grade. Both grades will be included in calculating the student’s grade point index for all purposes.

A student excluded on the basis of substandard academic performance shall not be re-admitted except in extraordinary cases when a satisfactory showing is made to the faculty, by written petition, that the substandard performance was the result of unusual circumstances beyond the control of the student, that such circumstances no longer exist, and that the student has the capability and desire to perform satisfactory work.

**REQUIREMENTS FOR GRADUATION:** Candidates for the degree of Juris Doctor (J.D.) must: (1) graduate of an approved college or university; (2) complete six semesters in residence at an approved law school, the last two of which must be at the University of Montana; (3) complete ninety semester hours of law with an index of 2.0 in all courses for which the student has registered and received a grade; and (4) complete the following required courses: all courses taught in the first and second years as specified in the program of instruction below, and the following third year courses: Courtroom and Office Practice, Federal Taxation, Law Review or Legal Aid are required each semester.

Candidates for graduation with honors must achieve an index of 4.3 (honors) or 2.3 (high honors) on law credits attempted and receive the recommendations of the faculty and the faculty of the University of Montana. A student who transfers credits earned elsewhere to this University must meet the indicated scholastic index on law grades earned at the University of Montana and on law grades earned elsewhere.

A candidate for the degree of Juris Doctor who has fulfilled the requirements for graduation will not be recommended for the degree if, in the opinion of the majority of the law faculty, he is unequal in accordance with generally accepted standards for admission to the bar.

A student may not register nor receive credit for more than 16 hours of law in a semester.

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>505</td>
<td>Civil Procedure I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>511-512</td>
<td>Contracts I, II</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>515</td>
<td>Criminal Law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>525</td>
<td>Introduction to Law</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>530-532</td>
<td>Legal Writing I, II</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>590-592</td>
<td>Professional Responsibility</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>598-599-398</td>
<td>Property I, II</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>515-516</td>
<td>Jurisprudence I, II</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

(Add 1 hour of Legal Method (Remedial) for those deficient grade points at end of first semester. No course credit.)

**SECOND YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>533</td>
<td>Agency &amp; Partnership</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>537</td>
<td>Civil Procedure II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>561-562</td>
<td>Commercial Transactions I, II</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>564-567</td>
<td>Constitutional Law</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>568</td>
<td>Corporations</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>560-562</td>
<td>Criminal Procedure</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>560-570</td>
<td>Estate Planning I, II</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>573</td>
<td>Evidence</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>585-586-585</td>
<td>Legal Writing III, IV</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**ALL COURSES IN THE FIRST TWO YEARS ARE REQUIRED**

**THIRD YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>690</td>
<td>Administrative Law</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>691</td>
<td>Comparative Law (Seminar)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>692-694</td>
<td>Contemporary Legal Problems (Seminar)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>615-616</td>
<td>Court Room &amp; Office Practice I, II</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>621-622</td>
<td>Creditor and Debtor</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>The Family (Seminar)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>631-632</td>
<td>Federal Tax I, II</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>686-689</td>
<td>Jurisprudence</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>641</td>
<td>Labor Law</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**LIBERAL ARTS—55**

**LIBERAL ARTS**

The Liberal Arts Curriculum includes Literature, Philosophy, Art, Foreign Languages and the Social Sciences. The latter includes Anthropology, Economics, History, Political Science, Sociology and Geography.

This program permits the student to work in a combination of the above areas rather than in a particular one of them and affords a varied selection from which to choose. During his last two years the student does more advanced work in two areas of his choice.

This curriculum is designed for the student who wants a liberal education with emphasis on the humanities and social sciences.

Students must have completed, or be eligible for, English 100 in order to major in this program. Upperclassmen transferring into this program should have at least a C average in all credits attempted. The liberal arts curriculum is not designed for the student who is undecided as to his major.

Following are the special requirements for the Bachelor of Arts degree with a major in Liberal Arts:

**University requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>English 100</td>
<td>3</td>
</tr>
<tr>
<td>Group I or II</td>
<td>English 101-102</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Foreign Language</td>
<td>23-30</td>
</tr>
<tr>
<td>10</td>
<td>Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>45</td>
<td>Major Requirements (courses under 300)</td>
<td>44-51</td>
</tr>
</tbody>
</table>

**Major Requirements:**

1. Art 200-201-202
2. Humanities 151-152-153
3. Anthropology, Economics, Geography, Psychology, Sociology, any (two) courses
4. History or Political Science or both (History 104-105-106 or 201-202 recommended)
5. Literature (English 211-212-213 and 231-232-233 recommended)
6. Philosophy (Philosophy 298, 299, 300 recommended)

**Elective credits to bring the total to 195**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>33-38</td>
</tr>
<tr>
<td>39-48</td>
</tr>
</tbody>
</table>

**LIBRARY SERVICE.** For information on courses, minimum requirements, preparation of school librarians, and the teaching minor in Library Service, check under the School of Education. See education courses 340, 341, 342, 343, 344, 345, 346, 441, 442, 443, 444, 445, 447, 448 and 449. No degree is offered at this time in this field.**
LINGUISTICS

is the science which investigates the structure of the languages and dialects which are in use, or have been in use, throughout the world. Its goal is to arrive at a body of knowledge about specific languages and about the nature of language, and ultimately to create theories of language. Linguistics has implications for many other disciplines and has various applications, particularly in teaching English and foreign languages. Although at present the University offers no degree in linguistics, a concentration in linguistics subjects would prepare a student to enter upon graduate work in linguistics and would provide him with a background to work in certain government and foundation supported language programs in the U.S. and abroad. The following is a list of linguistics courses offered by departments in the university (each is applicable to a major in the department concerned):

- Anthropology 380—Historical Linguistics
- Anthropology 480—Linguistic Methods
- English 360—Introduction to Linguistics
- English 371—The Structure of Modern English
- English 372—The History of the English Language
- English 373—Old English
- English 496—The Teaching of English as a Foreign Language
- English 497—Problems in English Linguistics
- French 401—Applied Linguistics
- German 401—Applied Linguistics
- Spanish 401—Applied Linguistics
- Romance Philology 360—Introduction to Romance Philology
- German 460—History of the German Language
- Spanish 460—History of the Spanish Language
- Speech Path. & Audiology or Speech Communication 119—Phonetics
- Speech Path. & Audiology or Speech Communication 232—Introduction to Communication (Phonology)
- Speech Path. & Audiology or Speech Communication 419—Advanced Phonology
- Speech Path. & Audiology or Speech Communication 420—Motor and Perceptual Phonetics
- Speech Path. & Audiology or Speech Communication 451—Psycholinguistics

MATHEMATICS

is a discipline of intrinsic beauty when considered as an independent entity; it is also a discipline of tremendous utility in the study of the physical, biological, and social sciences, and other disciplines in general. The importance and the usefulness of mathematics have never been greater than at present time, and, accordingly, the need for well-trained, competent mathematicians has never been greater than at the present time. This is indicated, in some measure, by the emphasis placed upon mathematics education and mathematics research by various agencies of the national government. The well-prepared graduate in mathematics will find excellent opportunities for a career involving teaching and research in an academic life at the high school or university level, or for a career in applied mathematics in business, industry, or government.

The Bachelor of Arts, Master of Arts and Master of Arts for Teachers, and Doctor of Philosophy degrees are offered.

HIGH SCHOOL PREPARATION. All mathematics courses for university credit require, as prerequisite, the equivalent of two years of high school algebra. Further, it is strongly recommended that the high school preparation include plane geometry, trigonometry and analytic geometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MATHEMATICS. In addition to the general requirements for the degree listed earlier in the catalog, the following requirements must be completed for the Bachelor of Arts degree with a major in mathematics. Math 151, 152, 153, 251, 252. A foreign language (German, French, Russian, or a combination of these) and English composition 101 and 200 are required. Students scoring at or below the 35th percentile on the ACT English test must pass English 101 before entering English 100. Those at or above the 92nd percentile are exempt from this requirement. For English 100 are not required to take 300. Students must select one of the following two options.

Option 1. Students planning to enter graduate work or industry are required to take Mathematics 311, 351, 352, 353, 421, 422, 423, and 9 credits in other approved Mathematics courses, including 3 credits in courses numbered above 400. The student must present 32 credits in at least three sciences selected from Botany, Chemistry, Geology, Microbiology, Physics, Zoology, and Mathematical Statistics (i.e., Mathematics 341, 342, 343, 351, 352, 353). However, the student to present 15 credits of French, German, or Russian and 18 credits in the above sciences, provided that the language substituted is not one offered to satisfy the language requirement listed earlier in the catalog, the following requirements must be completed for the Bachelor of Arts degree with a major in mathematics.

GRADUATE WORK. See Graduate School Bulletin and Mathematics Department Bulletin—Graduate Work in Mathematics. Additional information may be obtained from the Chairman of the Mathematics Department.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101 (100) INTERMEDIATE ALGEBRA. A remedial course, of which the content is second year high school algebra. (Credit not allowed toward a degree.)

116 COLLEGE ALGEBRA 5 prereq 001 or exemption by examination or two years of high school algebra. The study of the number system, algebraic operations, binomial theorem, inequalities, systems of linear equations, elementary theory of equations.

117 TRIGONOMETRY 5 prereq 116 or exemption by examination or four years of college preparatory mathematics including trigonometry. Trigonometric functions and their graphs, Pythagorean identities, addition formulas, laws of sines, cosines, and tangents, exponential and logarithmic functions and their graphs, solution of triangles.

118 INTRODUCTION TO CALCULUS 5 prereq 117, or exemption by examination or four years of college preparatory mathematics including trigonometry. Continuity, differentiation, integration of functions of one real variable, applications, the fundamental theorem of calculus. Credit not allowed for this course if Math 151 was previously taken.)

121 ELEMENTARY FUNCTIONS 5 prereq 001 or exemption by examination and high school trigonometry or three years of college preparatory mathematics including trigonometry. Trigonometric functions and their graphs, Pythagorean identities, addition formulas, laws of sines, cosines, and tangents, exponential and logarithmic functions and their graphs, solution of triangles. Further, it is strongly recommended that the high school preparation include plane geometry, trigonometry and analytic geometry.

125 STATISTICS 5 prereq 001 or exemption by examination or two years of high school algebra. Probability, statistical independence, sampling, tests of statistical hypotheses.

130 THEORY OF ARITHMETIC 5 prereq 001 or exemption by examination or four years of college preparatory mathematics including trigonometry. Continuity, differentiation, integration of functions of one real variable, applications, the fundamental theorem of calculus. Credit not allowed for this course if Math 151 was previously taken.)

151-152 CALCULUS I-II 5 prereq 121 or 117 or exemption by examination or four years of college preparatory mathematics including trigonometry. Limits, continuity, differentiation, integration, differentiation and integration of elementary functions, infinite series, Taylor series, applications.

153 LINEAR ALGEBRA 5 prereq 152. Vector spaces, determinants, matrices, applications in geometry.

199 UNDERGRADUATE SEMINAR V R-15. This course provides for special instruction in mathematics at the freshman and sophomore level.

200 INTUITIVE GEOMETRY 4 prereq 130 or c/i. Axiom systems, essentials of Euclidean plane geometry, and selected topics. (For elementary education majors.)

251 CALCULUS III 5 prereq 153. Partial differentiation, multiple integrals, line integrals, elementary theory of series of functions, improper integrals, applications to geometry.

252 CALCULUS IV 5 prereq 251. Development of concepts of limit, continuity, convergence, differentiation, and integration.

253 ELEMENTARY DIFFERENTIAL EQUATIONS 4 prereq 153. Solution of ordinary differential equations with emphasis on linear equations and applications to physical problems. Laplace transform methods and series solutions are considered.
MATHMATICS—57

271-272-273 COMPUTING AND MATHEMATICS 3 (3-4) prereq Math 001 and c/i. The elements of linear equations, inequalities, calculus logic and probability are presented with the aid of a digital computer. (271) Logic and probability, an introduction to programming. (272) Intuitive calculus. (273) Logic and probability theory. (Credit not allowed for this course and Computer Science 271-272-273.)

FOR UNDERGRADUATES AND GRADUATES

301-302-303 MATHMATICS FOR TEACHERS 3 prereq 153. An axiomatic treatment of mathematics chosen from numerical, algebraic, and geometric systems. The theory of algebraic equations with considerations for the secondary school curriculum. Various geometries and geometric transformations that appear in the secondary school curriculum. Content varied to meet the needs of the student. (Credit not allowed toward a degree in Mathematics.)

305 TOPICS IN MATHEMATICS V prereq 1 year experience in teaching high school mathematics. The main purpose of this course is to help the student to design curricula for students based on the needs of the students. Content varied to meet the needs of the student. (Credit not allowed toward a degree in Mathematics.)

306 HISTORY OF MATHEMATICS 4 prereq 18 credits in Mathematics. History 101-102 strongly recommended. An historical study of the development of mathematics from the Egyptian and Babylonian eras to the nineteenth century.

307 FOUNDATIONS OF MATHEMATICS 4 prereq 30 credits in mathematics. Axiom systems, logic, set theory, cardinal numbers, propositions equivalent to the axiom of choice, paradoxes and the avoidance of paradoxes, and intuitionism.


317 DIFFERENTIAL EQUATIONS 4 prereq 358. Existence of solutions, methods of solution, and applications of ordinary differential equations, with emphasis on linear equations. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

324-325 INTRODUCTION TO ALGEBRAIC STRUCTURES 3 prereq 252. Mathematical proofs, sets, mappings, and algebraic systems. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

327-328-329 MODERN ALGEBRA 5 prereq 252 and c/i. Groups, rings, integral domains, fields, and vector spaces. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

329 TOPICS IN ALGEBRA 4 prereq 227. A topic in advanced algebra is studied in appropriate depth. Possible topics may be chosen from the theory of groups, rings, fields, or commutative rings. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

337 (386) INTRODUCTION TO GENERAL TOPOLOGY 4 prereq 358 or c/i. Topological spaces, continuity, connectedness, compactness, convergence, separation axioms, metric spaces. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

341-342-343 MATHMATICAL STATISTICS 3 prereq 252 and c/i. Development of necessary mathematical concepts, probability, random variables and their functions, sampling, testing hypotheses, confidence intervals.

344-345-346 (362-363) STATISTICAL METHODS 3 prereq 252 or c/i. Probability theory as a model of random phenomena, sample spaces, the algebra of events, expectations, the weak law of large numbers and the frequency interpretation of probability, the nature of statistical inference. Assigned work on the digital computer. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

345-346-347 STATISTICAL METHODS 4 prereq 358 or c/i. Topological spaces, continuity, connectedness, compactness, convergence, separation axioms, metric spaces. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

347-348 (337-338) STATISTICAL METHODS 4 prereq 252 and c/i. Probability theory as a model of random phenomena, sample spaces, the algebra of events, expectations, the weak law of large numbers and the frequency interpretation of probability, the nature of statistical inference. Assigned work on the digital computer. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

351-352-353 MODERN ADVANCED CALCULUS 3 prereq 252 or c/i. Set theory, real number system, metric spaces, normed linear spaces with applications to differential equations, functions of several variables, inverse function theorem, integration and selected topics. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

355-356 (317-318) PRINCIPLES OF ANALYSIS 5 prereq 252 and c/i. Limits, continuity, differentiation, integration, series. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

359 TOPICS IN REAL ANALYSIS 4 prereq 358. A topic in advanced analysis is studied in appropriate depth. Possible topics include integral representations of trigonometric functions, metric spaces, and uniform convergence. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

360 COMPLEX ANALYSIS 4 prereq 358. Complex numbers, analytic functions, Cauchy integral formulae, residues and Laurent series, Taylor's theorem, applications to finite groups. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

370 COMPUTER METHODS 4 (3-2) prereq 252. Computer programming and survey of numerical methods. Problems of interest to secondary school teachers. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)


383 DIFFERENTIAL GEOMETRY 3 prereq 253. Curves and surfaces in three space, the Frenet formulas for a curve, first and second fundamental forms of a surface, Christoffel symbols and covariant differentiation on a surface, geodesics.

387 FOUNDATIONS OF GEOMETRY 4 prereq 252 and c/i. Axiom systems for geometries; extended consideration of one or more geometries. For those enrolled in Computer Science 251 and NSF Summer Institute. Other students may enroll by special permission.)

391-392 (324) ELEMENTARY NUMBER THEORY 5 prereq at least 20 credits in Mathematics with a grade of C or better. Congruences, finite fields, diophantine equations, continued fractions, continued fractions, algebraic numbers.

399 SEMINAR V R & S prereq c/i. Guidance in special work for advanced students.

411-412-413 (415-417-419) MATHEMATICAL METHODS OF SCIENCE 3 prereq 252, 306, 383. Introduction to the modern ideas of algebra, analysis, topology, set theory, real number system, metric spaces, normed linear spaces, the algebra of events, expectations, the weak law of large numbers and the frequency interpretation of probability, the nature of statistical inference. Assigned work on the digital computer. (Credit not allowed for this course and Computer Science 411-412-413.)

414-415-416 APPLIED STATISTICAL INFERENCE 3 prereq 252 and c/i. Confidence intervals, hypotheses testing, maximum likelihood estimation, sampling for linear regression, analysis of variance, stochastic processes, design of experiments, further topics to meet the needs of the students.

445-446 APPLIED STATISTICAL INFERENCE 3 prereq 341 and coreq 342 for 445: 446 and coreq 343 for 446. Application of statistical inference. Design of experiments, least squares procedures, non-parametric statistics and other topics chosen to fill the needs of the students.

452-453-454 REAL ANALYSIS 3 prereq 353. Lebesgue measure and integration. Lp spaces, elementary point set topology, metric spaces, and selected topics.

461-462-463 (409-411-412) COMPLEX ANALYSIS 3 prereq 353. Complex numbers and functions, analytic functions, Cauchy integral formulae, residues and Laurent series, Taylor's theorem, applications to finite groups. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

471-472-473 NUMERICAL ANALYSIS 4 (3-4) prereq 253 and c/i. The elements of linear equations, numerical solution of integral equations, numerical solutions of nonlinear equations, numerical integration of ordinary and partial differential equations, numerical solution of integral equations, and selected topics. Assigned work on the digital computer. (Credit not allowed for this course and Computer Science 471-472-473.)

FOR GRADUATES

Before beginning work on an M.A., a student should have an undergraduate major in mathematics with a B average in upper division courses in mathematics. As preparation for advanced courses, he should have Math 351-352-353 and Math 421-422-423.

511-512-513 ADVANCED MATHEMATICAL METHODS 3 prereq 413 or c/i. Theory of approximations including least-squares, Newton's method, and replacement of integral and differential equations by algebraic equations.

521 THEORY OF GROUPS 3 prereq 423. Sylow theorems and applications to finite groups. Series decompositions and selected topics.

522 THEORY OF FIELDS 3 prereq 423. Algebraic and transcendental number theory, Galois theory, algebraic functions, and/or ordered fields.

533 STRUCTURE OF RINGS 3 prereq 423. Radicals and the Wedderburn theorem. Group rings, tensor products, and selected topics.

524 COMMUTATIVE RINGS 3 prereq 423. Noetherian rings, integral domains, integral extensions, and related topics.

525 MODULES 3 prereq 3 credits from 521, 522, 523, or 524 or c/i. The language of categories, direct and inverse limits, projective and injective modules. Abelian categories, the Ext and Tor functors.

531-532-533 TOPOLOGY 3 prereq 353. Set theory, topological spaces, metrizability, continuous mappings, topological mappings, and selected topics.

532-533-534 MEASURE AND INTEGRATION 3 prereq 353, Abelian groups and modules, Radon-Nikodym theorem, Riesz representation theorem, Fubini theorem.

536-537 FUNCTIONAL ANALYSIS 3 prereq 353 and c/i. Topological linear spaces, including normed spaces, Banach spaces, and Banach algebras. Interior mapping principle, principle of uniform boundedness, Hahn-Banach theorem, closed graph theorem, weak and strong topologies, continuous linear operators, elementary spectral theory.
MEDICAL TECHNOLOGY

is a combined study of chemistry, physics, physiology and microbiology. A medical technologist is one who, by education and training, is capable of performing, under the supervision of a pathologist or other qualified physician, the various chemical, microscopic, bacteriologic and other medical laboratory procedures used in the diagnosis, study and treatment of disease. Four years are required to earn the degree of Bachelor of Science in Medical Technology. The first two years are devoted to the development of a sound foundation in physics, chemistry and microbiology and in obtaining an understanding of social science and cultural subjects. The last two years are designed to develop efficiency in the fields of microbiology and clinical methods.

To be certified by the Board of Registry, a student after satisfying the minimum course requirements, must have an internship of at least 12 consecutive months in an approved school of Medical Technology endorsed by the American Medical Association. Schools of Medical Technology are located in every state in the Union, the District of Columbia, Puerto Rico and the Canal Zone. After successful completion of internship, the student receives from the Board of Registry, certifying his qualification as a medical technologist. Although this certification is desirable, persons receiving the B.S. in Medical Technology are qualified bac­teriologists and can obtain positions in any laboratory technicians. Medical Technologists are in demand in hospital laboratories, in physicians' offices, research institutions, and in federal and state health departments.

Most medical technology schools require at least 3 years of college work and one year of hospital practice. The curriculum in this department has been arranged so as to allow the student to complete all course requirements during the first three years. It is possible then to take three years of college work and 12 months of hospital practice to be certified by the Board of Registry as a Medical Technologist.

Two options leading to a Bachelor of Science degree in Medical Technology are offered in the Department of Microbiology. Option I consists of four years of academic studies at the University, leading to a B.S. degree in Medical Technology. These students then fulfill the 12 months of hospital practice requested by the Board of Registry. Under Option II the student receives a B.S. in Medical Technology after approximately 5 1/2 years of academic study at the University and 12 months of hospital practice. Option I has a decisive advantage in giving the student a broader preparation for Medical Technology and a more balanced liberal education.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, it is recommended that high school preparation include Algebra, Geometry, Trigonometry, Chemistry, Physics and a foreign language.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MEDICAL TECHNOLOGY. In addition to the general requirements listed earlier in the catalog, the following courses are required by the Board of Science in Medical Technology. Microbiology 111, 200, 302, 310, 406, 411, 415, 420; Physics 111-112-113; Zoology 111-112-113, 202, 204, 313; Chemistry 121-122-123, 245, 261-262; Math 116, 117, 118 or Computer Science 271-272-273; English 100 and/or 300 and 450. A minimum total of 45 credits from Microbiology courses listed above and from the following courses is required: Microbiology 206, 207, 404, 405, 418, 419, 420; Chemistry 370, 481, 482, or any other courses approved by the advisor and the chairman of the Department of Microbiology.

SUGGESTED CURRICULUM

**Option I**

| Freshman Year | A | W | S
|---------------|---|---|---
| Chem 121-122-123—College Chemistry | 5 | 5 | 5
| Zool 111-112-113—Introduction to Biology, General Zoology | 5 | 5 | 5
| Micro 111—Survey of Microbiology | 5 | 5 | 5
| Math 116-117-118—College Algebra, Trigonometry, Introduction to Calculus | 5 | 5 | 5
| HPER—Physical Education | 1 | 1 | 1
| 17 | 16 | 16

**Sophomore Year**

| Junior Year | Physics 111-112-113—General Physics | 5 | 5 | 5
| Micro 202—Medical Microbiology | 5 | 5 | 5
| Micro 311—Immunology and Serology | 5 | 5 | 5
| Micro 415—Medical Mycology | 5 | 5 | 5
| Zool 304—Comparative Vertebrate Anatomy | 5 | 5 | 5
| Eng 330—Upper Division Composition | 3 | 3 | 3
| Group III or IV Electives | 6 | 6 | 6
| 16 | 16 | 16

**Senior Year**

| Senior Year | Micro 406-407—Clinical Microbiology | 5 | 5 | 5
| Micro 420—Virology | 5 | 5 | 5
| Micro 404—Molecular Genetics | 5 | 5 | 5
| Zool 315—Vertebrate Histology | 5 | 5 | 5
| Micro Electives | 3 | 3 | 3
| Eng 480—Advanced Composition | 3 | 3 | 3
| Electives | 6 | 6 | 6
| 16 | 16 | 16

**Option II**

Under Option II, a student must complete a minimum of 15 elective credits in residence during the senior year. Successful completion of the hospital training in a hospital approved by the American Society of Clinical Pathologists and the Department of Microbiology are required. The student will receive the equivalent of not more than 30 credit hours toward the B.S. degree for the successful completion of the hospital internship.

MICROBIOLOGY

is the study of microorganisms, including the bacteria, yeasts, molds, rickettsiae, viruses and protozoa. Special emphasis is placed on their structure, function, interactions, and relationships with man. Subtopics within the field of microbiology are listed under courses offered.

A Bachelor of Arts degree is granted upon successful completion of the curriculum in Microbiology. The initial work in this curriculum is intended to provide the student with a working knowledge of the basic principles of the physical and biological sciences and mathematics. The remaining study is devoted to a more intense and broadened training in Microbiology and ancillary fields, and may include independent study. This latter experience provides the student with an opportunity to prepare adequately for graduate studies.
Graduates are employed in clinical and research laboratories, in industrial and pharmaceutical laboratories, in county and state health offices, in various federal offices and laboratories, and in many other advantageous positions.

Highly capable graduates often continue their education in Microbiology at the graduate level. The Department of Microbiology offers the Master of Arts, Master of Science, and Doctor of Philosophy degrees. These degrees require an independent research project culminating in a thesis. Opportunities for persons holding graduate degrees in Microbiology are numerous and varied. The Department of Microbiology has available, for qualified graduate students, a number of teaching and research assistantships. (For general requirements of all graduate students and for information regarding graduate study in Microbiology, see Graduate School Bulletin).

### HIGH SCHOOL PREPARATION
In addition to the general requirements for admission to the University, it is recommended that high school preparation includes Algebra, Geometry, Trigonometry, Chemistry, Physics and a foreign language.

### SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MICROBIOLOGY
In addition to the general requirements for graduation listed earlier in the catalog, the following courses must be completed for the Bachelor of Arts degree in Microbiology: Microbiology 111, 200, 302, 310, 350, 404, 405, 411, 415, 439; Zoology 111-112-113; Chemistry 121-122-123, 245, 291-293; Physics 111-112-113, Math 116-117-118 or Computer Science 271-272-273; English 100 and/or 300 and 450. Students planning to do graduate work are recommended, in addition to the following courses: Chemistry 370, 481, 482; History 392-393-394; Philosophy 310.

The foreign language requirement listed earlier in the catalog must be satisfied. Normally Microbiology majors take 5 quarters of French, German, or Russian. Other languages or combinations must be approved by the department.

A minimum of 45 credits in the major field is required to receive a baccalaureate degree. This requirement may be satisfied by a successful completion of Microbiology courses listed above and any of the following courses: Microbiology 396, 397, 406, 406, 418, 419, 439; Zoology 321: Botany 441; Chemistry 481, 482, or any other courses approved by the advisor and chairman of the Department of Microbiology.

### SUGGESTED CURRICULUM

#### Freshman Year

<table>
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<tr>
<th>Course</th>
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<td>Chem 121-129-122—College Chemistry</td>
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<td>Zoology 111-112-113—Introduction to Biology</td>
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<td>Microbiology 111—Survey of Microbiology</td>
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<tr>
<td>Math 116-117-118—College Algebra, Trigonometry, Introduction to Calculus</td>
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<td>HPER—Physical Education</td>
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#### Sophomore Year

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<tr>
<td>Physics 111-112-113—General Physics</td>
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<td>English 345—Quantitative Analysis</td>
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<td>Microbiology 200—General Microbiology</td>
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#### Junior Year

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<td>English 300—Upper Division Composition</td>
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<td>Microbiology 350—Microbial Physiology</td>
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<td>Microbiology 380—Medical Microbiology</td>
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#### Senior Year

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<td>Microbiology 415—Medical Mycology</td>
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<td>Microbiology 420—Virology</td>
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<td>Microbiology 411—Epidemiology</td>
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<td>Microbiology 404—Molecular Genetics</td>
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<td>Microbiology 405—Seminar</td>
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### FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 ELEMENTARY MICROBIOLOGY 3 (3-4). The structure, function, and classification of bacteria, molds, yeasts, rickettsiae, and viruses, and their practical significance to agriculture, food, drug formulation, and public health. (Credit not allowed for both Microbiology 101—Elementary Microbiology Laboratory—which will strengthen their understanding of microbiological concepts.)

101 ELEMENTARY MICROBIOLOGY LABORATORY 2 (0-4). Microbiological examination of foods, water, soil and air and experiments with microorganisms of medical importance. (Not allowed toward a major in microbiology.)

102 ELEMENTARY MEDICAL MICROBIOLOGY 3 (3-4). Infections diseases, including concepts of virulence, resistance, prevention, and control of microbial diseases in the individual and in the community. (Not allowed toward a major in microbiology.)

111 SURVEY OF MICROBIOLOGY 1 (1-0) R-3. The field and subject matter of Microbiology. (Not applicable to Group I requirements.) (Required of all Microbiology and Medical Technology freshmen.) (Credit not allowed for both 100 and 300.)

200 GENERAL MICROBIOLOGY 5 (3-4) prereq Chem 123 or 102. Bacterial taxonomy, morphology, physiology, and ecology; effect of environmental factors on bacteria; microbiology of soil, water, milk and foods; and industrial microbiology. (Credit not allowed for both 100 and 300.)

202 MEDICAL MICROBIOLOGY 5 (3-4) prereq 200 or =. The pathogenic microorganisms; clinical, therapeutic and diagnostic aspects of the diseases they produce in man. (Credit not allowed for both 200 and 300.)

203 APPLIED MICROBIOLOGY 5 (3-4) prereq 200 or 100, 101. The fundamental principles of food, water, sewage, soil and industrial microbiology.

207 ENVIRONMENTAL HEALTH 3 (3-0) prereq 302. Environmental health as related to food, water, housing, institution, and recreational sanitation; sanitary disposal of liquid and solid wastes; vector control; communicable disease control; vital statistics; industrial hygiene; and environmental health administration.

310 IMMUNOLOGY AND SEROLOGY 5 (3-4) prereq 302.

350 MICROBIAL PHYSIOLOGY 5 (3-4) prereq 200.

404 MOLECULAR GENETICS 5 (3-4) prereq senior standing in one of the biological sciences and/or Biochemical mechanisms of mutation, DNA replication, nature of the genetic code, genetic recombination, genetic transcription and translation.

405 SEMINAR 1 (1-0) R-4 prereq 200, 302. Recent literature in microbiology and related subjects.

406 CLINICAL MICROBIOLOGY 3 (3-0) prereq 200, Chem 160, 262, or 266. Principles of hematology, blood chemistry, urinalysis and other clinical parameters of disease and health open to microbiology majors. (Credit not allowed for both 200 and 300.)

407 CLINICAL MICROBIOLOGY LABORATORY 2 (2-4) prereq or coreq 406 or Chem 304 or 481 or Zoöl 340. Clinical diagnostic methods.

411 EPIDEMIOLOGY 3 (3-0) a/y prereq 350. The classification, cytology, composition, genetics, metabolism and growth and significance of the yeasts.

418 YEASTS 3 (3-0) a/y prereq 350. The classification, cytology, composition, genetics, metabolism and growth and significance of the yeasts.

419 MYCOPLASMA AND L-FORMS 2 (2-4) a/y prereq 302. Physiology, immunology, pathogenesis, taxonomy, and interrelationships of microorganisms lacking cell walls, including Mycoplasma (PPLO and PPLO), bacterial, fungal and other L-forms, and bacterial protoplasts and spheroplasts.

420 VIROLOGY 3-5 (3-4) prereq 200. Properties, characteristics and infectious nature of bacteriophages, lysis, viruses, and rickettsiae.

430 SPECIAL PROBLEMS IN MICROBIOLOGY V 1-5 R-15 prereq 200, 302 and 3.5 average in biological sciences. Independent research.

FOR GRADUATES

500 ADVANCED TOPICS IN MICROBIOLOGY 2 (2-0) R-10.

501 SEMINAR 1 (1-0) R-9.

502 ADVANCED IMMUNOLOGY 3 (3-0) a/y prereq 310.

505 MICROBIOLOGY LITERATURE (1-0) R-9.

507 MICROBIAL CYTOLOGY 3 (3-0) o/y. Ultrastructure and function of microbial cells; methodology for study of the cytology of the cell.


509 ADVANCED VIROLOGY V 5-5 (3-5) prereq. 420 or Bot 327. Relationships of animal viruses to infectious diseases; tumor induction by viruses; molecular level of viral replication.

510 ADVANCED MICROBIAL PHYSIOLOGY V 3-5 (3-5) a/y prereq 360 or Chem 482. The various metabolic pathways found in microorganisms, with special emphasis on the isolation, structure, function, synthesis, and control of macromolecules.

511 IMMUNOCHEMISTRY AND IMMUNOGENETICS 3 (3-0) prereq. 310, Chem 481-482. Immunological responsiveness; antibody allotypes and immunogenetics.

580 MOLECULAR BIOLOGY SEMINAR 1 R (1-0) (Also listed as Bot 580 and Chemistry 580.)

600 RESEARCH V R-25 prereq 1 quarter of residence and full graduate standing.

685-686-687 ADVANCED MOLECULAR BIOLOGY LABORATORY 1-3 prereq 482 or c/i. Modern bio-chemically oriented research techniques. Cross listed as Botany, Chemistry, Pharmacy and Zoology.

699 THESIS V R-15.

MUSIC

The Music Department offers to students who have demonstrated talent in music, the opportunity to continue further study of music either for a profession or an avocation, and to acquire at the same time a broad general education. Complete sequences of courses are given to prepare a student for (a) a career as teacher or supervisor of music in the public schools, or for (b) a career directed toward composition, private teaching, and concert work, or for (c) thorough training in music within the structure of a broad liberal arts curriculum.

The Music Department is a member of the National Association of Schools of Music.

The following undergraduate degrees in music are offered by the Music Department:

Bachelor of Music Education
with a major in Elementary Music
with a major in Choral Conducting
with a major in Instrumental Conducting
and Music Administration
Bachelor of Music
with a major in Performance
with a major in Theory or Composition
Bachelor of Arts
with a major in Music.

GRADUATE WORK. See Graduate School Bulletin.

REQUIREMENTS FOR ADMISSION. In general, admission as a freshman in the Music Department is by certificate from the high school from which the student graduates. The faculty of the Music Department is more concerned with evidence of talent, consistent achievement in music, promise of development, and in scholarship in general, than it is in the precise content of the program while the prospective music student has followed prior to admission to correspondence or by interviews on the campus.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREES IN MUSIC. In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed:

1. For the Bachelor of Music Education, the course requirements in Curriculum A must be completed.

2. For the Bachelor of Music with a major in Performance or in Theory or Composition, the course requirements in Curriculum B must be completed.

3. For the Bachelor of Arts degree with music as a major, the course requirements in Curriculum C must be completed.

4. All students majoring in music are required to attend recitals as specified by the department.

5. All major students seeking a B.M., B.M.E., or B.A. degree are required to participate in Band, Orchestra or a Choral Group each quarter of residence of the regular school year (with the exception of the major in Elementary music). Students who are wind instrument majors in the performance field must register for band (or orchestra, if designated) every quarter, string majors must register for orchestra every quarter, voice majors must register for choir or collegiate chorale every quarter. Students registered in any group must participate in that group for the remainder of the academic year. Piano and organ majors must fulfill this requirement by the election of Music 140 or 140-110. Exceptions to this requirement may be made only by appeal to the Music Department.

6. All candidates for the Bachelor of Music or Music Education degree must satisfactorily demonstrate completion of 6 credits in Piano in 100 or completion of Piano in Class 217. Elementary music majors (Curriculum A-1) must complete 4 credits of piano 100.

7. Outstanding seniors in curriculum A or C may give joint senior recitals. Details will be supplied by the department on request.

8. All candidates for the B.M.E., B.M., or B.A. degree enrolled in Music 201 or 401 shall take a divisional jury in fall and winter quarters. All freshman, sophomores, and juniors majoring in Music shall take a divisional jury at the end of Spring quarter. At the option of the division and/or instructor concerned, all other students registered in Music 201 and 401 may be required to take a divisional jury at the end of any quarter. If to be exercised said option to have been exercised at the beginning of spring quarter. Students may be excused from divisional juries if (a) graduating in that quarter or (b) they have played a half or full quarter.

All students seeking upper-division standing shall take a full faculty jury in the spring quarter. The jury will include:

(a) Performance
(b) Sight-reading on performing instrument
(c) Sight-singing
(d) Evaluation of academic record for satisfactory completion, or current enrollment in 212, 238, 296, 217 (or functional), and six quarter of 201 (or the equivalent).

Failure to pass the jury will bar students from admission to music courses numbered 300 or above with the following exception: Transfer students who shall be admitted to 300 or above courses with the stipulation that they will have completed all lower division requirements within their first three quarters of residence.

STUDIO FEES

Non-Music Majors
One half-hour lesson per week .......... $12.00
Two half-hour lessons per week ........ $24.00
Three half-hour lessons per week ....... $36.00

Music Majors
One half-hour lesson per week ......... $12.00
Two or more half-hour lessons per week ...... $20.00

For majors and non-majors who register for studio instruction for less than a full quarter or who withdraw before the end of the quarter, a charge of $5.00 per quarter shall be made. Refunds are based on the number of weeks elapsed since the beginning of the quarter.

Lessons missed by the instructor will be made up within the quarter. Lessons missed by students or lessons falling on a legal holiday will not be made up.

Music Practice Fee: students enrolled in music courses involving use of practice rooms, pianos, and other university instruments, pay a fee of $5.00 per quarter.

A. CURRICULUM FOR BACHELOR OF MUSIC EDUCATION DEGREE

For students who sincerely feel the challenge and vital service opportunity in the teaching profession, and whose high school background includes experience in musical organizations, the University of Montana offers the degree of Bachelor of Music Education, which meets the state requirements for certification for public school teaching (see Education).

(1) with a major in Elementary Music: training and background preparation for teaching elementary special and general music classes in the elementary grades (K-8).

Music course requirements for Curriculum A (Elementary) shall include a total of 70 credits as follows: 201 (Piano or voice), 6 cr.; 401, 1 cr.; 100 (Piano or voice), 4 cr.; 103, 2 cr.; 106-110 or 140 (with faculty approval), 6 cr.; 320, 1 cr.; 321, 1 cr.; 328, 1 cr.; 331, 3 cr.; 353 and 356, 8 cr.; 334, 335, 336, 557, 11 cr.; 320, 3 cr.

In cases of a demonstrated proficiency in piano or voice other applied study may be substituted with the approval of the music faculty.
Non-music requirements shall include the following: English 100, 300, and 600, 12 credits; Psychology 110, 3 credits; Mathematics 100-106, 4 credits; Drama 101, 3 credits. Group I requirements shall be satisfied by Music 100, 300, and 445. Group II requirements shall be satisfied by Music 100 or 201, 30 credits. Group III requirements shall be satisfied by Mathematics 100-106, 4 credits; English 100; Psychology 110; HPER; Academic Electives, 13 credits.

Non-music requirements include a minimum of 59 credits, including English Composition, 9 credits, and Foreign Language, 15 credits.

Suggested Freshman Program: Music 201, Theory I, Aural Perception I, Introduction to Music Literature; English 100; HPER; Academic Electives, 13 credits.

MAJOR IN VOCAL

Music course requirements for Curriculum B with Major in Voice shall include a total of 121 credits as follows: 201, 21 cr.; 401, 24 cr.; 106 or 107, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 4 cr.; Music History, 9 cr.; Piano in Class, 6 cr.; 331, 3 cr.; 445, 2 cr.; Upper division electives, 12 cr.; and 140 (vocal repertoire), 6 credits.

Non-music requirements include a minimum of 59 credits, including English Composition, 9 credits.

Suggested Freshman Program: Music 201, 106 or 107; Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature; English 100; HPER; Academic Electives, 13 credits.

MAJOR IN ORCHESTRAL INSTRUMENT

Music course requirements for Curriculum B with a Major in an Orchestral Instrument shall include a total of 121 credits as follows: 201, 21 cr.; 401, 24 cr.; 106 or 107, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 4 cr.; Piano in Class, 6 cr.; 125, 4 cr.; Music History, 9 cr.; 140, 6 cr.; 331, 3 cr.; Upper division electives, 12 cr.; 445, 2 cr.

Non-music requirements include a minimum of 59 credits, including English Composition, 9 credits.

Suggested Freshman Program: Music 201, Band or Orchestra, Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature; English 100; HPER; Academic Electives, 13 credits.

MAJOR IN COMPOSITION OR THEORY

Music course requirements for Curriculum B with Major in Composition or Theory shall include a total of 120 credits as follows: 201, 6 cr.; 401, 6 cr.; 100, 6 cr.; 106-110, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 4 cr.; Piano in Class, 6 cr.; 125, 4 cr.; Music History, 9 cr.; 140, 6 cr.; 331, 3 cr.; Upper division electives, 12 cr.; 445, 2 cr.

Non-music requirements include a minimum of 60 credits, including English Composition, 9 credits.

ADDITIONAL REQUIREMENTS: Students taking voice or instrument in the Music Major in Piano must complete Music 100 (Piano) prior to jury examination.

Theory Majors are not required to take Music 359, and Music 459.

Composition Majors: A faculty jury examination of representative work in composition must be passed at close of sophomore year. Seniors will present a major of original music (or equivalent) for solo voice or instrument, and vocal and instrumental groups including at least one composition for large ensemble.

Suggested Freshman Program: Music 201, 100, 106-110; Theory I, Aural Perception I, Composition, Introduction to Music Literature; English 100; HPER; Academic Electives, 13 credits.

C. CURRICULUM FOR BACHELOR OF ARTS DEGREE WITH A MAJOR IN MUSIC

Students with a pre-college background in applied music may elect Curriculum C, a course designed to develop musicianship, to gain necessary insight into the theoretical music, and to develop substantial background in the Arts and Sciences. This degree does not qualify a student for public school teaching in Montana but does provide groundwork for graduate study in the fields of musical performance and scholarship in preparation for teaching careers in colleges or private schools.

Minimum credit requirements for this degree are: a minimum of 57 credits in Music and a minimum of 120 credits in non-music courses (excluding PE) of which 93 credits must be in the College of Arts and Sciences. Music Electives and Minor electives are not applicable toward this degree: Applied Music, 12 cr.; Ensemble Music, 6 cr. (however, Music Department requires participation in ensemble during all resident quarters).

Course requirements for Curriculum C shall include: Music 201, 6 cr.; 401, 6 cr.; Music 106-110, 6 cr.; Music 111-112-113, 6 cr.; 138-139, 12 cr.; 201, 202, 203, 6 cr.; upper division music electives, 13 cr.; English Composition, 9 cr.; HPER, 3 cr.; Foreign Language, 30 cr.; English Composition, 9 cr.; HPER, 3 cr.; Foreign Language, 30 cr.

Suggested Freshman Program: Music 201, 106-110; Theory I, Aural Perception I; Introduction to Music Literature; English 100; HPER; Academic Electives, 21 cr.

COURSES OF STUDY

Upon entrance into any applied music course the student will be given a detailed schedule, particularly with regard to his ability, previous training and experience entitle him.

MUSIC—100—Performance Minor 1-2 prerequisites 1.

Individual instruction in voice, piano, organ, string, wind, and percussion instruments. Various curricula provide for study in a performance minor. This study is designed to give the beginning instrumental or vocal student basic technique and a basis for further specialization.
student certain proficiencies in order that he may use this applica-
tion both as a medium of performance. A total of 12 credits is al-
lowed in any one performance area.

MUSIC 201, 401 Performance Major V 1-4 R-24 prereq audition and c/l. (6 quarters of each course).

Individual instruction in voice, piano, organ, string, wind, and percussion instruments. The student in Curriculum A must have a field which is secondary to their primary major, i.e., Music Educa-
tion. A student entering in Music 201 should show evidence of the equivalent of two years’ prior study. Students majoring in Applied Music (Curriculum B) must show talent for solo and evidence of the equivalent of four years’ prior study. A senior recital must be given before graduation.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

102-103-104 REPERTORY BAND, CHOIR, ORCHESTRA 1 R-3. The literature of school music. Observation of conducting and teach-
ing methods. Study of secondary instruments.

110 SUMMER SESSION CHOIR I. 1

110 COLLEGIATE CHOIR I. 1

110 UNIVERSITY BAND 1. 1

Courses 106 through 110 are major musical organizations. Pre-
req c/l. Music majors must satisfy requirements as stated for each curriculum; non-music majors may apply 6 credits toward gradu-
ation.

112-113-114 THEORY I 2. Materials and structure of music. A continuation of the course in two, three, and four-part writing and
at the keyboard. 112 is prerequisite to 113 and 113 is prerequisite to 114.

114-115-116 PIANO IN CLASS 1. All major and minor scales 2 octaves. All major and minor triads in all positions. Harmo-
nization of simple tunes with IV, V, and I chords. Materials such as Oxford and Burrows Adult Beginners books. Transposition, memorization, and sight-reading.

117-118-119 VOCIE IN CLASS 1. Breathing, resonance, vowel formation, and posture. The student must have a basic knowledge of vocal techniques as demonstrated in class. Prereq c/l. 118 may be waived on basis of proficiency examination. It is desirable to take Voc 201 before enrolling for this sequence.

125-126-127 STRING INSTRUMENTS IN CLASS 1. Group instruc-
tion for beginners on violin, viola, cello, and bass, with emphasis on teaching procedures.

128-129-130 WOODWIND; BRASS; PERCUSSION AND BAND 2. (128) Basic instruction in brass and woodwind instruments. Prereq c/l. 129 is prerequisite to 130. 129 is prerequisite to 130. Prereq c/l. 128, 129, and 130 are designed for beginners in music and for students who have had some experience in music. Prereq c/l. 129 may be counted as an elective in the Music major.

134 INTRODUCTION TO CONCERT MUSIC 4 (3-3). Music in our present-day culture; illustrated lectures for the layman on forms, styles and composers of concert music. Guided listening to record-
ing to include a concert attendance. For students in music.

135 INTRODUCTION TO MUSIC LITERATURE 4. The ele-
ments of musical understanding; the place of music in history with emphasis on its relation to social change and to the history of other arts. Comparative survey of masterpieces of music from the Rena-
sesce through the Twentieth Century. Review of all periods of music history. Study of recordings. Concert attendance required. Open to non-majors with c/l. (Credit not allowed for both 134 and 135.)

138-139 AURAL PERCEPTION II 2 prereq or coreq 112-113. A laboratory course in singing and dictation to supplement Theory I. 1

140 ENSEMBLE GROUPS 1. Any small group of two or more players may have a course outlined by the instructor. Students must show evidence of basic musical training. Further development of harmony, transcription, and development of ear (music reading). Materials such as Pizzuti Improvisations and Bartok Mikrokosmos Books I and II.

234-235-236 HISTORY OF MUSIC 1 prereq 135. Enter any quar-
ter. The history of music in Western Civilization from its origin to modern times and its relationship to general cultural develop-
m.
PHARMACY—63

511 (431) ADVANCED CONDUCTING 3 R-12 preq: 322 (Choral majors), 333 (others), and c/l. A continuation of 311-332-333. Class and/or individual study of conducting with emphasis on performance with university performing groups.

512 LITERATURE FOR HIGH SCHOOL INSTRUMENTAL GROUPS 2 a/y. Comparative study and performance of new publications.

513 LITERATURE FOR HIGH SCHOOL CHORAL GROUPS 2 a/y. Comparative study and performance of new publications.

514 CURRENT LITERATURE FOR HIGH SCHOOL SOLO AND SMALL ENSEMBLE GROUPS 2 a/y. Comparative study and performance of literature with attention to pedagogical use as related to style.

515 PROBLEMS IN TEACHING ELEMENTARY MUSIC 2 a/y. Evaluation of new approaches; state and city course outlines; Music in upper elementary schools; approach to music as a class study.

516 PROBLEMS IN TEACHING JUNIOR HIGH SCHOOL MUSIC 2 a/y. Evaluation of new courses of study; Development of curriculum for general and special classes; Problems selected for class study.

517 ORFF AND KODALY APPROACHES TO ELEMENTARY MUSIC 2 a/y. Procedures currently in use in Germany and Hungary.

518 CHILDREN'S MUSIC LITERATURE 2. Texts, recordings, and books related to growth in musical understanding through the child's reading and listening.

519 TESTS AND MEASUREMENTS IN MUSIC 2. Evaluation of selected standardized tests.

520 RESEARCH IN MUSIC EDUCATION 2. Research problems; their statement, organization, techniques, evaluation; summarization, and publication of research findings.

521 SCHOOL MUSIC ADMINISTRATION 3. School systems, plans for organizing and administering the music program in the elementary and junior high schools; Procedures for the school music supervisor; The primary purpose in advanced study is preparation for administrative or supervisory work in music education.

522 MUSIC IN HIGHER EDUCATION 3. A survey of administrative problems, curricular content, contemporary teaching techniques, teaching personnel, and other areas of interest to the music teacher at the college level.

530 INDEPENDENT STUDY V R-9. Students must have projects approved by a music staff member before enrolling.

531 SYMPHONIC LITERATURE 3. A survey of orchestral music; the Mannheim school, the Viennese classics, the Romantics, and contemporary European and American developments.

532 OPERATIC LITERATURE 3. Opera from its beginnings, the Florentine Camerata, 16th and 17th century French and Italian opera, Gluck's reform, Mozart's dramatic works. The Romantic opera in Italy and Germany, contemporary opera trends.

533 KEYBOARD LITERATURE 3. Keyboard literature from the developments of the Baroque era to the contemporary period, including the suite, sonata, character pieces, etc.

534 CHAMBER MUSIC LITERATURE 3. Survey of chamber music, quartet, trio, sonata, etc. Contact with technical combinations and the interpretation of selected works.

535 SONG LITERATURE 3. The art song from the classic period to the contemporary era including the German lied, French chanson, and related literature.

538 CHORAL LITERATURE 3. Survey of both secular and sacred music for choral ensembles, dealing chiefly with the music from the 16th century to the contemporary school.

539 TRENDS IN CONTEMPORARY MUSIC 3. A survey of trends in European and American music from the end of World War II to the present. Emphasis on the development of electronic music, the serial technique, and other new techniques of composition.

540 HISTORY OF AMERICAN MUSIC 3. The development of American music from its antecedents. The effect of an evolving democratic state on the arts, the development of various centers of performing arts and the types of music performed.

541 INTRODUCTION TO MUSICOLOGY 2. Nature, scope, and goal of musicology, its methods and history. Survey of bibliography, different approaches and styles of scholarly writing. Formats and techniques of writing.

542 MEDIEVAL AND RENAISSANCE MUSIC 3. Survey of music from monophony to the 16th century.

551-555-553 ADVANCED ORCHESTRATION 2 preq: 329. Styles in orchestral techniques from 1750 to present.

554-555-556 ANALYTICAL TECHNIQUES 2. A survey of the theoretical and analytical approaches of leading composers from the polyphonic period to the present.

557 TECHNIQUES OF COMPOSITION 2. An introduction to composition for graduate students. Development of techniques and skills necessary to the composer.
1. The general requirements for admission to the University of Montana as listed earlier in the catalog.

2. At least two years as prescribed in the pre-pharmacy curriculum (may be transferred from another college):
   
   First year: Chemistry 121-122, 123, English, Physical Education 100 (3 cr.), Math 116, 117, Zoology 111, 113, and electives.
   

   Applicants presenting two years of satisfactory college work but with grade deficiencies in the above list may be admitted, but such deficiencies must be removed.

   The English composition requirement should be completed by the end of the third year of full-time college enrollment. Effective fall quarter 1969 and based on ACT norms for college-bound students, those below the 25th percentile shall take English 001, 100 and either English 300, 301, or Speech Communication 111. Those above the 25th but below the 90th percentile, the student shall take English 100 and either English 300, 450 or Speech Communication 111. The student must complete either ACT score or above the 90th percentile and is required to take only one quarter of English 300, 450 or Speech Communication 111.

   Each applicant for admission to the professional curriculum must have a cumulative grade point index of at least 3.00 on all college work taken, and completed for credit at the time he makes application for admission to the first professional year. Application forms for admission to the professional curriculum may be obtained from the School of Pharmacy. Completion and submission by the faculty of the school prior to registration. Application forms will then be granted full or provisional admission, or may be denied admission.

   The autumn quarter of the senior year is the normal time of admission to the School of Pharmacy.

   SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PHARMACY. A candidate for admission to the senior year in the professional curriculum must have a grade point deficiency of more than 10. If he has a greater deficiency, he will not be granted senior standing but will be required to retake such courses, as a rule, during the winter quarter in which he is granted a grade of "P" until he has reduced his deficiency to 10 or less. The student must fulfill all required courses for the first four years of study before he may enter the fifth year of the program. Then he may be granted full or provisional admission, or may be denied admission. Candidates for the degree of Bachelor of Science in Pharmacy must:

   1. Meet the general University requirements for graduation.
   2. Complete not less than five full academic years of training, including both pre-pharmacy instruction and a minimum of three years of professional instruction, in order to meet the accreditation requirement of a minimum of three full years of professional instruction for the Bachelor of Science degree, each candidate must complete a minimum of 135 credits in professional or approved elective courses during the three academic years in the professional program. To meet this requirement, each candidate should expect to complete an average of 45 credits per year.

3. Complete not less than 250 contact hours of course work, plus 3 credits in required Health and Physical Education and basic ROTC courses when these are taken.

   REQUIREMENTS FOR LICENSURE IN MONTANA. An applicant for licensure as a pharmacist in the State of Montana must pass an examination by the Board of Pharmacy. To be qualified for this examination, the applicant shall be a citizen of the United States, of good moral character, at least twenty-one years of age, and shall be a graduate of an accredited school of pharmacy. However, such an applicant shall not be permitted to sit for examination until he has completed an internship following graduation, in an approved pharmacy.

   GRADUATE WORK. See Graduate School Bulletin.

   PHARMACY CURRICULUM

   First year: English or Speech Communication 111; Business Administration 201; Chemistry 411, 412, 415, 480 or 385; Pharmacy 306, 301, 330, 342, 361, 381, 382, 396, and electives.

   Second year: Microbiology 200, 200; Pharmacy 204, 414-415-416, 423, 454, 455, 456, 458, and electives.

   Third year: Microbiology 411: Pharmacy 503, 504, 505-506, 516, 517-518-519, 545, 557, 577, 578, 596, and electives.

   FOR UNDERGRADUATES

   For Explanation see Course Descriptions (Index).

   110 USE AND ABUSE OF DRUGS 3. The nature of drugs: their historical development and normal use in treatment of disease. Drug dependence and abuse, the special classes and types of drugs involved. (Not open to pharmacy majors.)

   306 (206) ORIENTATION TO PHARMACY 1 (1-0).

   320 (220) PHARMACEUTICAL CALCULATIONS 3 (2-2).

   324 (242) PHARMACOGNOSY 4 (3-3) prerequisite Chem 482 or =. Plant and animal products used in pharmacy and medicine.

   330-331 PHARMACOLOGIC PRINCIPLES 3 prerequisite or coreq Zoology 341. Concepts of dosimetry, and other factors governing the known functional activity of prototype drugs that influence the mind or body or both.

   361 (461) PHARMACY 5 (3-4) prerequisite 320 and Chem 262. Fundamental techniques of pharmacy and the various classes of pharmaceutical preparations.

   FOR GRADUATES

   362 (562) PHARMACUS APPLICATIONS TO PHARMACY 2 (3-0) prerequisite 320 or prerequisite. Exercises in programming with reference to pharmacy, finances and drug activity.

   404 INTRODUCTION TO DISPENSING 2 (1-2) prerequisite 463.


   418 MEDICINAL CHEMISTRY LABORATORY 2 (0-6 to 9) R-prerequisite 414. Synthesis, identification and purity tests of organic medicinals.

   425 (325) PHARMACOGNOSY 4 (3-3) prerequisite Chem 482 or =. Continuation of 324.

   440 DRUGS OF PSYCHOPHARMACOLOGY 3 (3-0) prerequisite Chem 320 and 462, Zool 341. Drugs which influence behavior.

   442 (340) RADIOPHARMACOLOGY 2 (2-0) R-prerequisite Chem 476 or c/l. Drug metabolism and internal dosimetry.

   444 APPLIED PHARMACOLOGY 5 (5-0) prerequisite 330, 331, Chem 482. Therapeutic and toxicologic aspects of chemical agents used as drugs.

   452 (326) DRUG ANALYSIS 4 (2-6). Special and instrumental methods used in the analysis of pharmaceutical preparations.

   462 (362) PHARMACY 5 (3-4) prerequisite 320, 361 and Chem 262. Continuation of 361.

   466 MEDICINAL PLANTS AND PHARMACOCHEMICAL TECHNIQUES V 1-5 (0-3/cr) R-prerequisite 425. Collection, extraction and identification of the constituents of plants of medicinal importance, using chromatography and instrumental techniques.

   483 DRUG MICROSCOPY V 1-4 (0-3/cr) R-prerequisite Bot 115 or =. Microscopic and micro-chemical examination of drugs, foods and spices. The electron microscope will not be used.

   500-504 BIOLOGICAL MEDICINAL PRODUCTS 3 (3-0) prerequisite Microh 362. Biologicals, antibiotics, vitamins, hormones, and other medicinal products of biological origin.

   505-506 DISPENSING 4 (2-4) prerequisite 404.

   516 MEDICINAL LAW 3 (3-0) prerequisite senior standing in pharmacy.

   517-518-519 PHARMACEUTICAL PRACTICE 1 (0-3) prerequisite senior standing in pharmacy.

   545 APPLIED PHARMACY 5 prerequisite 444. Continuation of 444.

   575 TOXICOLOGY 2 (2-0) prerequisite 416. The role of the pharmacist in poisoning prevention and emergency treatment.

   577-578 PHARMACY ADMINISTRATION AND FINANCIAL MANAGEMENT 3 (3-0) prerequisite senior standing in pharmacy.

   FOR UNDERGRADUATES AND GRADUATES

   555 ADVANCED PHARMACY V 3-5 (6-9 to 15) prerequisite 506 or =. Problems involved in formulation and preparation of pharmaceuticals.

   570 COSMETICS 3 (1-6) prerequisite 463. Cosmetic formulation.

   585 ADVANCED DRUG ANALYSIS 3 (1-4) prerequisite 452.

   590-593 HOSPITAL PHARMACY 1-3 (0-2/cr) prerequisite 505. Instruction and participation in the routine of a hospital pharmacy.

   594 INSTITUTIONAL PHARMACY 3 (3-0) prerequisite c/l coreq 593. Duties and responsibilities of a pharmacist practicing in a hospital or related institution.

   596 SEMINAR 1 (1-6) R-prerequisite senior standing in pharmacy.

   599 SPECIAL PROBLEMS IN PHARMACY V 1-5 (0-5/cr.) R-prerequisite senior standing in pharmacy or c/l. Research studies by conference, library and laboratory research in pharmacy, pharmaceuticai chemistry, pharmacognosy, pharmacy administration or pharmacy.

   FOR GRADUATES

   580 ADVANCED PHARMACEUTICAL LAW 3 (3-0) prerequisite c/l. Federal laws affecting the pharmaceutical industry.

   581 DRUG DEVELOPMENT AND MARKETING 3 (3-0) prerequisite c/l. Administrative activities and decisions involved in the development and distribution of pharmaceutical products.

   582 ADVANCED PHARMACY ADMINISTRATION 3 (3-0) prerequisite c/l. Analysis of the pharmaceutical industry.

   586 PARENTERAL PREPARATIONS 3 (2-6) a/y. Evaluation of the various methods currently used in the preparation of bulk and individual dosage unit sterilized products.

   587 CHROMATOGRAPHY 3 (2-6) a/y. Advanced theory and applications of the various techniques of modern chromatography. All phases, column, paper, thin-film, gas and ion exchange, will be explored and evaluated.

   589 ADVANCED PHARMACOCHEMICAL TECHNIQUES V 1-3 (0-5/cr.) R-prerequisite 466 or c/l. Techniques used in investigative pharmacognosy.
PHILOSOPHY—65

605 CHEMISTRY OF NATURAL PRODUCTS 3 (3-0) R-9 prereq 410 and 428.
608 PHARMACEUTICAL CHEMISTRY 3 (3-0) R-9 prereq 416.
611 ADVANCED MEDICINAL CHEMISTRY LABORATORY 2 (0-6 to 8) R-6.
619 ADVANCED PHARMACOLOGY V 3-5 (0-9 to 15) prereq 548 or 551. The more involved actions of drugs upon cells and organs.
620 PHARMACEUTICAL MANUFACTURING 3 (1-6) R-6.
623 PHYSICAL PHARMACY 3 (3-0) R-6. Pharmaceutical kinetics and biopharmaceutics.
624 PRODUCT DEVELOPMENT AND FORMULATIONS 3 (0-9) R-6 prereq 630.
665-689-697 ADVANCED MOLECULAR BIOLOGY LABORATORY V 1-3 prereq Chem 482 or c/i. (Crosslisted as Botany, Chemistry, Microbiology, Zoology.)
699 THESIS V R-15.

FOR UNDERGRADUATES AND GRADUATES
200 (203) HISTORY OF MODERN PHILOSOPHY 5 prereq 299.
301-302-303 GREAT PHILOSOPHERS 1. (Given in the Summer for 10 credits per quarter.) (302) Greek, Roman, and early Christian thinkers. (303) Late Medieval, Renaissance and some modern thinkers. (303) Recent and contemporary thinkers. Not open to Philosophy majors for graduate credit.
310 (333) PHILOSOPHY OF SCIENCE 5 o/y prereq c/l. The metaphysical foundations of modern classical (Newtonian) science; contemporary views on the nature and limitations of scientific "correlations," the concept of models and theories.
311 (332) PHILOSOPHY OF LANGUAGE 5 e/y prereq c/l. Structure and functions of natural and ideal languages; the relations of language to thought and to reality.
320 CONTEMPORARY ETHICAL THEORIES 5 prereq 120 and/or 360.
323 (369) POLITICAL PHILOSOPHY 3 o/y prereq 5 credits in philosophy. Basic concepts, ideals, and principles which underlie the political theories and programs of the Western world. Special attention will be given to Democratic forms of government and to the balance of liberal and conservative elements in them.
330 PHILOSOPHY IN THE TWENTIETH CENTURY 5 prereq 10 credits in Philosophy in
331 PHILOSOPHICAL FOUNDATIONS OF THE SOCIAL SCIENCES 5 o/y prereq 10 credits in Philosophy and c/l. Philosophical problems with respect to representative theories in Psychology, History, Sociology.
332 AESTHETICS 3 prereq 3 credits in Philosophy. The nature of aesthetic experience, the standards of art criticism, and the kinds of knowledge communicated by art. Readings from philosophers, artists, and art critics.
341 PHILOSOPHY IN LITERATURE 3 prereq 10 credits in Philosophy or Literature or =. Philosophical thought in selected masterpieces of literature.
345-346-347-348 PHILOSOPHY OF THE ARTS 3 credits in Philosophy or 3 credits in music, visual arts, literature or =. Enter any quarter. (345) Music. (346) Visual arts. (347) Literature. (348) Film. Examination of philosophical problems related to the particular arts and discussion of the nature of the arts.
350 THEORY OF KNOWLEDGE 3 e/y prereq 10 credits in Philosophy. Some traditional and contemporary views of the source, nature, and extent of knowledge with special attention paid to the relation of perception to the physical world, and to the concept of mind.
351 METAPHYSICS 3 prereq 10 credits in Philosophy. What are the basic questions of Metaphysics? What questions does it attempt to answer? What questions is it fitted to answer? Traditional and contemporary pursuits of these questions.
354 PHILOSOPHY OF RELIGION 5 e/y prereq 5 credits in Philosophy. Philosophical interpretation of religious experience, belief and practice.
355 ORIENTAL THOUGHT 4 o/y prereq 5 credits in Philosophy and c/l. Philosophical themes in some Hindu, Buddhist and Taoist literature.
357 THE PHILOSOPHY OF HISTORY 5 e/y prereq c/l. The development, structure, and functions of the speculative and analytic philosophies of history. Toward the anatomy of history and the relevance of the philosophy of history for the working historian.
360 PLATO 5 e/y prereq 298 or 10 credits in Philosophy and c/l. Reading and interpretation of selected works.
361 ARISTOTLE 5 e/y prereq 298 or 10 credits and c/l. Reading and interpretation of selected works.
365 DESCARTES, SPINOZA, LEIBNIZ 5 e/y prereq 300 or 10 credits in Philosophy and c/l. The development of Continental Rationalism.
366 LOCKE, BERKELEY, HUME 5 o/y prereq 298 or 10 credits in Philosophy, and c/l. The development of British Empiricism.
367 KANT 5 o/y prereq 300 or 10 credits in Philosophy and c/l. Reading and interpretation of selected works.
370 MAJOR PHILOSOPHERS OF THE NINETEENTH CENTURY 5 e/y prereq 300 or 10 credits in Philosophy and c/l. Selection to be announced in the class schedule.
373 EXISTENTIALISM 5 prereq 10 credits in philosophy and c/l. Selected readings from the philosophical works of one or more existentialist thinkers.
390 PROBLEMS IN PHILOSOPHY V prereq c/l.
393-394 SEMINAR: HISTORY OF PHILOSOPHY V prereq c/l.
395 SEMINAR: PHILOSOPHY OF SCIENCE V prereq 298 and 310 and c/l.
396 SEMINAR: RESEARCH IN PROBLEMS OF PHILOSOPHY V prereq c/l.
400 RESEARCH V R-15. Work on selected problems under direction.
699 THESIS V R-15.

PHILOSOPHY

is the search for wisdom by carefully reasoned reflection. Philosophical enquiry is concerned with such questions as: How can we distinguish reality from appearance? Is the world to be understood as a quantity of material objects, as a framework of mental experiences, or as an open field for action? By what methods can man attain knowledge and what kinds of knowledge? Are values derived from personal feelings or from standards which may be impersonal, verifiable, unchanging? Are there significant relations among phases of experience reflected in science, art, religion, morality and politics?

Courses in philosophy acquaint the students with the views of great philosophical thinkers, past and present. Discussion and written work are largely concerned with evaluating the reasoning by which each thinker develops his point of view.

The Bachelor of Arts and Master of Arts degrees are offered.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PHILOSOPHY. In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed for the Bachelor of Arts degree with a major in Philosophy: a minimum of 50 credits including Philosophy 110, 210, 268, 299, 300, and three or more credits in courses numbered 400 or above. Normally students are expected to complete Philosophy 298, 299, 300 by the end of their sophomore year. The foreign language requirement listed earlier in the catalog must be satisfied. A major whose written work is deficient for work in the department will be required to take an appropriate English course.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES
For Explanation see Course Descriptions (Index)
100 INTRODUCTION TO PHILOSOPHY 5. The main problems of metaphysics, theory of knowledge, and moral philosophy; the manner in which great philosophers reach their conclusions.
110 LOGIC 5. Deductive and inductive inference, kinds of definition, the detection of fallacies, and the methods of science.
120 ETHICS 5. The nature of moral values, standards of moral judgment, moral problems in personal life and in social relations.
210 SYMBOLIC LOGIC 5. A systematic study of deductive logic using modern symbolic techniques.
296 (201) HISTORY OF ANCIENT PHILOSOPHY 5.
299 (202) HISTORY OF MEDIEVAL AND RENAISSANCE PHILOSOPHY 5 prereq 296.

FOR GRADUATES
PHYSICAL THERAPY

is an associated medical profession which includes the use of heat, cold, light, sound, electricity, massage, exercise, and mechanical devices as aids in the diagnosis and treatment of patients.

During the first three years the student completes 150 credits, 3 of which must be in required physical education activity courses. This work is to include the general requirements for graduation (the second and third years must be taken in residence at the University of Montana). The fourth or professional year of training, involving twelve to sixteen months of work, would be taken at any physical therapy school meeting standards established by the Council on Medical Education and Hospitals of the American Medical Association. (Not all therapy schools accept students with three years of background. Some schools, for example, require a college degree for admission, while other accept only students who plan to obtain a degree from the school offering the therapy work.)

Course work taken at the therapy school will be evaluated by the University of Montana. This evaluation must result in an accumulation of the equivalent of forty-five quarter hours of credit and sufficient grade points to meet graduation requirements of the University of Montana. Also, the student must be eligible for a certificate in physical therapy from the therapy school. When the above requirements have been satisfied, the student is eligible to become a candidate for the degree of Bachelor of Science in Physical Therapy from the University of Montana (see course listings of the physical education department for information regarding a four-year pre-physical therapy program.)

Many therapy schools specify that the applicant must not have reached his thirty-sixth birthday. In addition, some schools require a "C+" minimum grade point average. Courses in the biological and physical sciences must be "C" or better for acceptance by a number of these schools.

The demand for physical therapists far exceeds the supply. Therapists may be found working in general hospitals, rehabilitation centers, children's hospitals, public health centers, geriatric hospitals, private clinics, Veterans Administration hospitals, orthopedic clinics, athletic training rooms, physicians' offices and school systems.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs algebra and trigonometry. It is also recommended that the high school preparation include advanced algebra and solid geometry. Credit not allowed for both 111-112-113 and 221-222-223.

PHYSICS

is the science that has as its objective the formulation and verification of laws or relationships among the different physical quantities. Some of the most important of these quantities are mass, time, length, force, energy, momentum, electric charge, electric field strength, entropy, wave length. These quantities and the relations among them, that we call laws, have been found to serve in and to explain a wide range of phenomena such as occur in the subjects of mechanics, heat, electricity, magnetism, light, atomic and nuclear physics and in such related subjects as engineering, biophysics, meteorology and geophysics. In addition the subject of philosophy is profoundly influenced both by the methods and development of physics.

The Bachelor of Arts and Master of Arts degrees are offered.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs algebra and trigonometry. It is also recommended that the high school preparation include advanced algebra and solid geometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PHYSICS. In addition to the general requirements for graduation listed earlier in the catalog, fifty-five credits in physics must be earned for the Bachelor of Arts degree with a major in physics. In preparation for advanced courses, a student should take Physics 221-222-223 in the fall of the sophomore year. The following courses are offered in other departments: Mathematics 121, 151, 152, 153, 251, 252, 253. The foreign language requirement for candidates for the degree must be satisfied. English 100, 300 and 450 are required, except that students scoring less than the 61st percentile on the English section of the ACT test are required to take English 101 and all students receiving 94th percentile or higher are exempt from English 100 and 300.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

 För Explanation see Course Descriptions (Index)

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<td>221-222-223</td>
<td>GENERAL PHYSICS</td>
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FOR UNDERGRADUATES AND GRADUATES

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<td>314-315-316</td>
<td>ELECTRICITY</td>
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<td>322-323-324</td>
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<td>329</td>
<td>METHODS OF TEACHING PHYSICS</td>
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<td>331</td>
<td>MECHANICS AND HEAT</td>
<td>5 (5-0)</td>
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<td>332</td>
<td>ELECTRICITY RADIATION AND ATOMIC PHYSICS</td>
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<td>FUNDAMENTALS OF MODERN PHYSICS</td>
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<td>371-372-373</td>
<td>(471-472)</td>
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<td>446-447-448</td>
<td>(346-347-348)</td>
<td>HEAT, THERMODYNAMICS, STATISTICS</td>
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<td>NUCLEAR PHYSICS</td>
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</table>
POLITICAL SCIENCE

is the study of government and politics both in their domestic and international aspects. By meeting requirements outlined below, a student may earn a Bachelor's degree in Political Science, in Political Science and Economics, or in Political Science and History. A Master of Arts degree in Political Science is also offered.

Courses offered in the Political Science department are designed to aid students in attaining the following objectives:

1. To assist all students in securing a broad liberal education and to equip them with the foundations for effective discharge of the duties of American citizenship;
2. To provide undergraduate preparation for those students who propose to continue the study of Political Science at the graduate level with the ultimate goal college teaching and research;
3. To offer a broad program of training for those students who plan careers in government or politics, including training for both the foreign service and the domestic public service at the national, state and local levels;
4. To assist in preparing students for careers in teaching at both the elementary and secondary levels;
5. To provide a sound background for those students who intend to enroll in law and other professional schools.

The major fields of Political Science are (1) American Government and Politics with national, state and local government, politics, and public law as sub fields, (2) Public Administration, (3) Political Theory, (4) Comparative Government, and (5) International Relations, Organization and Law.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN POLITICAL SCIENCE. In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed for the Bachelor of Arts with a major in Political Science: English 100 and 300 unless exempt by examination, Economics 201-202-203 and a minimum of 45 credit hours in Political Science with 30 credits from courses numbered 300 and over.

Political Science courses required of all majors are: 201, 202, 231 and 300, and one course from the two disciplines of which at least 20 credits must be in Political Science and 20 credits in History. A minimum of 30 credits must be selected from courses numbered over 300.

A student may offer a combination major in Political Science and History with a minimum of 60 credits selected from the two disciplines of which at least 20 credits must be in Political Science and 20 credits in History. A minimum of 30 credits must be selected from courses numbered over 300.

A student may offer a combination major in Political Science and Economics with a minimum of 60 credits selected from the two disciplines; at least 27 credits must be in each discipline. Required courses are: Political Science 201, 203; and Economics 251, 252, 255, 301, and 311. At least 12 additional credits will be chosen from upper division economics courses and 13 additional credits from Political Science. Twelve hours of the Political Science work must be in upper division courses.

Either the completion of five quarters of a foreign language or the demonstration of a satisfactory reading knowledge of historical, legal or political science materials in such a language is required. With the consent of the Chairman of the Department the student may fulfill the language requirement by completing three quarters in each of two languages.

GRADUATE WORK. See Graduate School Bulletin.
Students in Pre-veterinary Medicine and in Optometry are to plan their programs carefully to ensure that the University of Montana in order to ensure meeting the admission requirements to a School of Veterinary Medicine, or Optometry.

The successful pre-med student must do well in the basic sciences and other college work. He must master more than two years of college chemistry, and do well in college mathematics, physics, and zoology. To be considered by a School of Medicine the pre-med student must place high on the Medical College Aptitude Test which he ordinarily takes during his junior year. The same holds true for the pre-med student who must do well in the American Dental Aptitude Test. Superior scholarship is of importance since medical and dental schools have more applicants than they can accept for admission.

HIGH SCHOOL PREPARATION. High school students who are contemplating a career in the Pre-medical Sciences curriculum at the University should plan on a program of high school studies which will include 3-4 years of mathematics, some Latin or several years of a modern foreign language, experience in Chemistry and Physics, and considerable background in literature and social science.

PRE-MEDICAL SCIENCES STUDENT. The majority of medical schools now expect a broad background of knowledge, experience, and training on the part of applicants. The field in which a student receives his Bachelor's degree is not important provided he has the minimal course requirements in the Pre-medical Sciences, demonstrates a high level of competency, and is relatively well balanced.

Applicants for entrance to Schools of Medicine exceed the number that are admitted so well qualified, well motivated, well qualified, and competent students are admitted to Schools of Medicine. Well qualified students from the University are usually accepted into Medical Schools.

The Pre-medical Sciences student is advised to get a Bachelor's degree in a field of his own choice. However, he should make sure that he can satisfy within the time available (1) the University requirements for graduation, (2) the minimum pre-medical science requirements listed below, and (3) the major requirement in his chosen major field. The student should consult with the pre-medical sciences advisor during the freshman year, and consult with both the pre-medical sciences advisor and the major advisor beginning not later than the sophomore year in residence.

The Western Interstate Commission for Higher Education was designed to provide financial aid to Medical, Dental, Veterinary, and other professional students attending Western professional schools.

MINIMUM COURSE REQUIREMENTS FOR THE PRE-MEDICAL SCIENCES STUDENT: English, Physical Education, Group, and other University requirements listed earlier in the catalog; Chemistry through Organic, Quantitative, and Survey of Physical; one year of college mathematics; one year of college physics; Zoology through Embryology and Genetics; a reading knowledge or 23 credits in French, German, or Spanish. A degree in a related field such as Chemistry, Mathematics, Microbiology or Zoology may be earned by completing course work in the area selected as approved by the Chairman of the major department concerned. See Chemistry and Zoology for degrees in those areas with the Pre-med Option.

PRE-MEDICAL SCIENCES CURRICULUM

(Dentistry, Medicine, Veterinary Medicine)

Freshman Year

<table>
<thead>
<tr>
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Sophomore Year

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PRE-NURSING

The School of Nursing at Montana State University, Bozeman, accepts transfer students from the University of Montana who have completed one of two PRE-Nursing programs listed below. (The three-quarter sequence is intensive and is recommended for only the best students.) Students with sophomore standing who desire admission to the School of Nursing, Montana State University, Bozeman, must plan to enter during Summer Quarter after completion of their freshman year. Students with sophomore standing wishing admission to a school of nursing other than that of Montana State University should consult the catalog of the school of their choice for the selection of a freshman program.

For graduation listed earlier in the catalog, a psychology major must complete at least 45 credits in psychology which must include Psychology.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PSYCHOLOGY. In addition to the general requirements for graduation listed earlier in the catalog, a psychology major must complete at least 45 credits in psychology which must include Psychology.

PSYCHOLOGY

is the science of the behavior of man and other animals. The psychologist, employing scientific methods, seeks to further the understanding and prediction of the behavior of living organisms. Today, psychologists perform important functions in most organizations, be they academic, business, government, health, military, or social service.

The department offers the Bachelor of Arts, Master of Arts and Doctor of Philosophy degrees. Although various jobs are available for those possessing the B.A. degree in psychology, those students interested in a career as a psychologist should plan to continue their education at the graduate level.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PSYCHOLOGY. In addition to the general requirements for graduation listed earlier in the catalog, a psychology major must complete at least 45 credits in psychology which must include Psychology.

FOR GRADUATES

501-502-503 PROSEMINAR 8 (8-0) prereq graduate standing in psychology. Survey of the basic fields of psychology. (501) Learning, motivation and thought processes (502) Comparative, perceptual, physiological, and sensory. (503) Personality, psychopathology, and social.

505 PROFESSIONAL PROBLEMS IN PSYCHOLOGY 2 (2-0). Open only to graduate majors in psychology. Bibliographic problems and the literature search; forms and problems of scientific communication; professional associations, relations with other professions and the public; legal and ethical problems of the psychologist.
510 HISTORY AND SYSTEMS OF PSYCHOLOGY 4 (4-0). Development of concepts, systems, and theories in psychology.

512 THEORIES OF LEARNING 4 (4-0). Critical review of current learning theories based on analysis of fundamental concepts, experimental data, and theoretical implications.

513 ADVANCED LEARNING 4 (4-0). Principles and methods pertaining to the acquisition and retention of new behaviors.

514 THOUGHT PROCESSES 4 (4-0) prereq 10 credits from 310, 311, 312 and 220. Experimental and theoretical analysis of problem solving, concept formation, and other complex symbolic behavior.

515 ADVANCED MOTIVATION 4 (4-0). Drive, incentive and other affect variables as they influence performance.

516 ADVANCED COMPARATIVE 4 (4-0) Directed towards a synthesis of existing data from various life forms into universal principles of behavior.


521-552 ADVANCED PSYCHOLOGICAL STATISTICS 4 (4-0). Application of statistical procedures to the design of experiments; assumptions underlying techniques of sampling and measures of association and significance.

530 ADVANCED DEVELOPMENTAL PSYCHOLOGY 4 (4-0). Behavioral development through the life span. Emphasis on analysis of research and theoretical interpretation.

540 INTERVIEW AND CASE HISTORY TECHNIQUES 2 (1-2). Clinically oriented. Client centered, supportive and consulting interviewing. A behavioralistic orientation toward case history taking is presented.

544 ADVANCED SOCIAL PSYCHOLOGY 4 (4-0). Theory and experiment in the analysis of individual behavior in relation to social stimuli.

550-552 PSYCHOLOGICAL EVALUATION 4 (3-2) prereq c/l. Administration, scoring, and interpretation of standard tests, with supervised practice. (550) Individual and group tests of aptitudes and intellectual abilities. (551) Objective measures of personality functioning: introduction to projective techniques, TAT and related tests. (552) Rorschach and other projective approaches.


561 ADVANCED PSYCHOPATHOLOGY 4 (4-0). Symptoms, etiology, diagnostic criteria and treatment of the major functional and organic disorders; research literature.

562 ADVANCED SENSORY SYSTEMS AND PERCEPTION 4 (4-0).

563 ADVANCED PHYSIOLOGICAL PSYCHOLOGY 4 (4-0). Brain mechanisms and behavior; electrophysiological correlates of behavior.

570 CLINICAL PSYCHOLOGY 4 (4-0). A general survey of the field; types of cases handled by the clinician; techniques in evaluation and therapy; contributions in consultation, training and research.

586 PRINCIPLES OF PSYCHOTHERAPY 4 (4-0) prereq 561. Major theoretical and technical approaches to psychotherapy.

590 INDEPENDENT RESEARCH V 1-6 R-18.

599 THESIS V R-10.

600 TOPICAL SEMINAR V 1-3 R. Advanced treatment of highly specialized topics of current interest.

601 SEMINAR IN MEASUREMENT V 1-3 R.

602 SEMINAR IN EXPERIMENTAL V 1-3 R. Topics in learning, motivation, perception, and sensory processes.

603 SEMINAR IN SYSTEMATIC V 1-3 R. Topics in history systems, and theories in psychology, including theory construction.

604 SEMINAR IN CLINICAL V 1-3 R.

605 SEMINAR IN COMPARATIVE AND PHYSIOLOGICAL V 1-3 R.

606 SEMINAR IN PERSONALITY AND SOCIAL V 1-3 R.

670 CLINICAL PRACTICUM 2 (0-4) R-12 prereq c/l. Supervised practice of clinical techniques in a professional setting.

675 CLINICAL INTERNSHIP 0 prereq acceptable proficiency in clinical techniques. Clinical internship offered by the psychology staff of a hospital, clinic, or other approved agency.

596 ADVANCED PSYCHOTHERAPY 2 (3-0) R-4 prereq 586 or c/l. A continuous and intensive study of the psychotherapeutic relationship and the various therapeutic techniques including supportive, client-centered, analytic, hypnotherapeutic.

590 ADVANCED CLINICAL PRACTICUM 2 (0-4) R-6 prereq 685. Directed experience in clinical supervision.

690 DISSERTATION V R-30.

**RADIO AND TELEVISION**

Courses are designed to prepare students for occupations in the broadcast media, for effective use of radio and television in connection with occupations in other fields, or for greater appreciation of the media as audience members. Graduates in radio- television have many vocational opportunities as announcers, performers, writers, newsmen, program directors, managers, and executives of radio and television stations, or as radio-television specialists in advertising agencies, and other businesses.

Students work toward either a Bachelor of Arts degree in Journalism with specialization in radio and television, or a Bachelor of Arts degree in Radio and Television. In either case, emphasis is placed on a strong liberal arts background, and approximately three-fourths of the courses for either degree will be taken in the College of Arts and Sciences. Production of programs for broadcast from the University's radio station, KUFM, and closed circuit television studio is included in the course of study.

**NOTE:** Students wishing to major primarily in radio or television journalism should take the radio-television sequence in Journalism.

The School of Journalism offers the following curriculum leading to a Bachelor of Arts degree in Radio-Television.

**University Requirements**

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<tr>
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<tr>
<td>Group III</td>
<td>12</td>
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<tr>
<td>Group IV</td>
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<tr>
<td>Foreign Language</td>
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**Additional Requirements:**

| Group III                                 | 12      |
| Group IV                                  | 13      |
|                                          | 48      |

**Free Electives**

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<tr>
<td>341-342-343</td>
<td>341</td>
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<td>344-345-346</td>
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<td>394, 397</td>
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<td>Group III</td>
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**FOR UNDERGRADUATES AND GRADUATES**

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<tr>
<td>399 ADVANCED RADIO-TELEVISION PROBLEMS V</td>
<td>prereq</td>
</tr>
<tr>
<td></td>
<td>consent of the chairman.</td>
</tr>
<tr>
<td>440 CINEMATOGRAPHY</td>
<td>(see Journalism).</td>
</tr>
<tr>
<td>441-442-443 TELEVISION PRODUCTION AND DIRECTION 3</td>
<td>12 hours in radio-television courses.</td>
</tr>
<tr>
<td></td>
<td>Preparing, producing and delivering television programs.</td>
</tr>
<tr>
<td></td>
<td>Preparation of news and special affairs programming for television.</td>
</tr>
<tr>
<td>494 RADIO-TELEVISION SEMINAR 3 prereq or coreq 441</td>
<td>Radio and television and their effect on society with emphasis on responsibilities of the broadcasting industry.</td>
</tr>
</tbody>
</table>
RELIGIOUS STUDIES

The proper sphere for the academic study of religions is understood to be coextensive with the broad field of human learning in which the question of the humanity of man lies closest to the surface. It is intended that the study of religions at our University therefore be taken-up in closest conjunction with the humanities, arts, letters, and the natural, social and life sciences. Radical relations are planned with existing departments in these areas, with regard both to curriculum and faculty.

In the course offerings of the Department two emphases are expected to prevail: first, the scholarly analysis and transcription of the enormous body of literature on the world’s religions and, second, the sensitization of the student to the pertinence of religious studies for a critical and appreciative stance toward his personal and social existence. Thus courses are designed to liberate the student from the dominance of modern western and non-western cultures generally, and the American cultural situation in particular. The anticipated result will be liberating in the fundamental sense of the “liberal arts;” the student of religion will be afforded critical distance on his own religious tradition and at the same time liberate to appreciate the faith of his fathers and alien faiths on a new and richer plane.

Inaugurated in 1969, the Department is still in process of formation; thus a major in the Department and various degree programs have still to be formulated. The following list of courses is by no means complete and will be revised with the addition of faculty.

101-102 INTRODUCTION TO THE STUDY OF RELIGION 3. Enter either quarter. Religion as a humanistic discipline: the phenomenology of religion and other aspects of culture and in relation to root human questions.

112 JEWISH AND CHRISTIAN LITERATURE OF LATE ANTIQUITY 3. The phenomenology of the Jewish and Christian traditions, including both canonical and non-canonical materials.

201-202 HISTORY OF THE ANCIENT NEAR EAST 3. Enter either quarter. (201) History of the Ancient Near East from the Neolithic period to the time of Alexander the Great; (202) From 333 B.C. to A.D. 325. The 650 year period of Hellenistic civilization with special emphasis on the problem of cultural syncretism.


212 THE LEGACY OF PAUL 3. The life and letters of Paul; the structure of the Pauline understanding of the Christian faith; the legal and social background of Paul's thought.

226 THE RISE OF HISTORICAL CONSCIOUSNESS IN THE ANCIENT NEAR EAST 3 preq History 201 or R.S. 201. Mythology, mythography, ethnography and rule historiography and their influence on the development of Western culture.

226 CHRISTIANITY AND MARXISM 3 preq 5 credits of Political Science or c/i. Intellectual, social, and political engagement between and between different forms of Christianity and Marxism, primarily in the west.

226 CONTEMPORARY THEOLOGY 3 preq 3 credits in Philosophy or R.S. The thought of major Christian figures, Protestant and Roman Catholic, in the 20th Century.

231 THE BIBLE IN THE AMERICAN TRADITION 3 preq History 261 or 262 or c/i. Primary documents in the history of American biblical interpretation; the relation of biblical interpretation to the development of religious and social culture.

232 CONTEMPORARY BIBLICAL INTERPRETATION 3 preq 3 credits in Biblical Interpretation or c/i. Major biblical interpreters in the twentieth century.

327-328-329-330 RELIGION IN THE HELLENISTIC PERIOD 3 preq History 201 and 202, or R.S. 201 and 202. Enter any quarter. Study major religious traditions of late antiquity, including an analysis of their place in the wider Hellenistic context (328) Christianity (329) Judaism (330) Gnosticism. (320) Graeco-Roman religions.

331 RHETORIC IN CLASSICAL GREEK AND SEMITIC LITERATURE 3 preq R.S. 212. Greek 211 and 212. Rhetoric from Gorgias and the Hebrew homily through Paul.

346 RELIGION AND SOCIAL REALITY 3 preq 5 credits in sociology or c/i. Critical analysis of social values and “societal” from the standpoint afforded by various religious traditions.

347 HUMAN SPIRIT AND TECHNOLOGY 3 preq 10 credits in physical sciences or c/i. The relation between "reverence" and "technology in human society. Religion and science will be used, but the emphasis will fall on modern industrial society.

348 GOD-LANGUAGE IN NINETEENTH CENTURY THOUGHT 3 preq 10 credits in Philosophy or c/i. Theories of deity (especially the origins of the "death of God" idea) in 19th century Europe, especially in Hegel, Nietzsche, Feuerbach, Stirner, Marx, and Kierkegaard.

RESERVE OFFICERS TRAINING CORPS

The ROTC program is conducted by career Army and Air Force personnel. Both departments offer a two-year or a four-year program. The satisfactory completion of either program and being awarded a degree from the University results in a Reserve Commission in the Army or Air Force. Pursuance of either program is on an elective basis. Students interested in careers in the Air Force or Army should consult the Professor of Aerospace Studies or the Professor of Military Science.

AIR FORCE ROTC

The Department of Aerospace Studies offers a two-year or four-year program leading to a Reserve Commission in the U.S. Air Force. The program is designed to develop leadership skills and attitudes vital to the career professional Air Force officer. The two-year program is tendered to students enrolled in either General Military or the Professional Officer Course. Further information may be obtained from the Department of Aerospace Studies.

GENERAL MILITARY COURSE

101-102-103 WORLD MILITARY SYSTEMS 2. Enter any quarter. The doctrine, mission, and organization of the United States Air Force; U.S. strategic offensives and defensive forces; their mission, function and employment of nuclear weapons; civil defense; aerospace defense; U.S. general purpose and aerospace support forces; the mission, resources, and organization of Special Forces, with special attention to limited war. One hour classroom and one hour Corps Training each week.

201-202-203 WORLD MILITARY SYSTEMS 2. Enter any quarter. Prereq 101-102-103. Defense policies; nature and context of war; military policies and strategies of major world powers; the role of alliances in U.S. defense policies; defense organization and decision-making; organization and function of the Department, role of the military in the United States' national policies; the elements and process of defense decision-making. One hour classroom and one hour Corps Training each week.

PROFESSIONAL OFFICER COURSE

Completion of the General Military Course (Field Training for the Two-Year Program and one year of the Professional Officer Course. In addition the student must enlist in the Air Force Reserve. Graduates of the Professional Officer Course draws from the University or for other specific reasons, pass a physical examination and the Air Force Officer Qualifying Test.

101-201-202 GROWTH AND DEVELOPMENT OF AEROSPACE POWER 3 c/i. (201) The development of airpower from the beginnings of manned flight to 1961. (302) Aerospace Power today, the future of manned and unmanned space and space operations. Attention is devoted to developing the communication skills needed of Air Force officers. Three academic class hours and one hour of Corps Training per week which provides for advanced leadership experiences.

304 FIELD TRAINING 0. Four weeks of training conducted on an Air Force base in the summer for Air Force ROTC cadets participating in the four-year program. Cadets, assigned to the two-year Air Force, air crew and aircraft indoctrination, officer orientation, military fundamentals and physical training.

401-402-303 THE PROFESSIONAL OFFICER 3 c/i. (401) Foundations and responsibilities of officer leadership in the military, the role of military leadership in the military, the role of military leadership in the military, the role of military leadership in the military. (402) Leaders and management problems pertinent to the Air Force officer. Communicative skills and problem solving. Three class hours and one hour of Corps Training per week. Corps training provides practical work in command and staff positions with primary responsibility for the preparation and conduct of the Corps Training Program.

TWO-YEAR PROGRAM

The two-year program requires the student to pass a physical examination, the Air Force Officer Qualifying Test; attend either Week Field Training and complete the Professional Officer Course. A monthly retainee fee (current $50) is paid by students enrolled in either the General Military or the Professional Officer Course. Scholarships (full tuition, fees, book allowance and the monthly retainee fee) are awarded to students enrolled in either the General Military or the Professional Officer Course. Further information may be obtained from the Department of Aerospace Studies in the professional officer course.

FIELD TRAINING 0. Four weeks of training conducted on an Air Force base in the summer for Air Force ROTC cadets participating in the four-year program. Cadets, assigned to the two-year Air Force, air crew and aircraft indoctrination, officer orientation, military fundamentals and physical training.

401-402-403 THE PROFESSIONAL OFFICER 3 c/i. (401) Foundations and responsibilities of officer leadership in the military, the role of military leadership in the military, the role of military leadership in the military. (402) Leaders and management problems pertinent to the Junior Air Force Officer. Communicative skills and problem solving. Three class hours and one hour of Corps Training per week. Corps training provides practical work in command and staff positions with primary responsibility for the preparation and conduct of the Corps Training Program.

GENERAL MILITARY COURSE

101-102-103 WORLD MILITARY SYSTEMS 2. Enter any quarter. The doctrine, mission, and organization of the United States Air Force; U.S. strategic offensives and defensive forces; their mission, function and employment of nuclear weapons; civil defense; aerospace defense; U.S. general purpose and aerospace support forces; the mission, resources, and organization of Special Forces, with special attention to limited war. One hour classroom and one hour Corps Training each week.

201-202-203 WORLD MILITARY SYSTEMS 2. Enter any quarter. Prereq 101-102-103. Defense policies; nature and context of war; military policies and strategies of major world powers; the role of alliances in U.S. defense policies; defense organization and decision-making; organization and function of the Department, role of the military in the United States' national policies; the elements and process of defense decision-making. One hour classroom and one hour Corps Training each week.

PROFESSIONAL OFFICER COURSE

Completion of the General Military Course (Field Training for the Two-Year Program and one year of the Professional Officer Course. In addition the student must enlist in the Air Force Reserve. Graduates of the Professional Officer Course draws from the University or for other specific reasons, pass a physical examination and the Air Force Officer Qualifying Test.

101-201-202 GROWTH AND DEVELOPMENT OF AEROSPACE POWER 3 c/i. (201) The development of airpower from the beginnings of manned flight to 1961. (302) Aerospace Power today, the future of manned and unmanned space and space operations. Attention is devoted to developing the communication skills needed of Air Force officers. Three academic class hours and one hour of Corps Training per week which provides for advanced leadership experiences.

304 FIELD TRAINING 0. Four weeks of training conducted on an Air Force base in the summer for Air Force ROTC cadets participating in the four-year program. Cadets, assigned to the two-year Air Force, air crew and aircraft indoctrination, officer orientation, military fundamentals and physical training.

401-402-303 THE PROFESSIONAL OFFICER 3 c/i. (401) Foundations and responsibilities of officer leadership in the military, the role of military leadership in the military, the role of military leadership in the military. (402) Leaders and management problems pertinent to the Junior Air Force Officer. Communicative skills and problem solving. Three class hours and one hour of Corps Training per week. Corps training provides practical work in command and staff positions with primary responsibility for the preparation and conduct of the Corps Training Program.
FIELD TRAINING. Six weeks of training conducted on an Air Force base in the summer, prior to entry into the Professional Officer Class. Skills and knowledge required of military personnel: fundamental knowledge of the Aerospace Forces of the United States, organization charts, history, and the Air Force Basic crew and aircraft indoctrination; officer orientation and physical training. 

GROWTH AND DEVELOPMENT OF AEROSPACE POWER 3. (Same as for the four year program.)

THE PROFESSIONAL OFFICER 3. (Same as for the four year program.)

FLIGHT INSTRUCTION PROGRAM

The Flight Instruction Program is offered to all pilot qualified AFROTC cadets during their senior year. Successful completion leads to a private pilot license and entry into the U.S. Air Force Pilot Training Program.

CLASSROOM INSTRUCTIONS 0 core 405. Pre-Flight, Meteorology; Aircraft Radio Communications; Radio Navigation; Federal Aviation Regulations; Flight Planning; Weather; Piloting; and Aircraft Flight. Six week summer camp following the sophomore year. A monthly retainer (current $90) is paid to cadets selected in the school year's selection and course series. An option flight training program for qualified cadets is offered. In addition, a limited number of scholarships are available for students enrolled in the four year program. Further information may be obtained from the Professor of Military Science.

ARMY ROTC

The Department of Military Science offers a two and a four year program leading to a commission in the United States Army Reserve. The four year program satisfies both the commission and university requirements for a baccalaureate degree.

The four year program requires completion of Military Science courses during four years of attendance at the University. In addition, a six-week summer camp is required during the initial summer of the fourth year. The two year program is a competitive program and encompasses the on-campus portion of the last two years of the four year program, and the six-week summer camp upon completion of the junior year of ROTC. However, as a prerequisite to beginning this course, the student must attend a six-week summer camp following the sophomore year. A monthly retainee (current $90) is paid to cadets selected in the school year's selection and course series. In addition, a limited number of scholarships are available for students enrolled in the four year program. Further information may be obtained from the Professor of Military Science.

FOUR YEAR PROGRAM

BASIC COURSE: GENERAL MILITARY EDUCATION

INTRODUCTION TO THE ARMY 2. (101) An introduction to the organization of the Army and an evaluation of Military Weapons Systems. Leadership, drill and command, basic and progressive training in leadership through practical exercise in drill, ceremonies and military customs and courtesies. (102) National Security and the United States Army with emphasis on the Army's role as part of the National Defense Team. Continuation of leadership, drill and command. (103) Continuation of National Security and the United States Army with emphasis on the Army's role as part of the National Defense Team. Continuation of leadership, drill and command.

ADVANCED INDIVIDUAL TECHNIQUES 2 prereg 101-102-103. (201) Topographical recording techniques with emphasis on the Army's role as part of the National Defense Team. Continuation of leadership, drill and command with emphasis on small unit activities. Continuation of leadership drill and command. (202) Survey of operations of Security Forces. Continuation of leadership, drill and command. (203) Principles and techniques of tactical operations with emphasis on small unit activities. Continuation of leadership, drill and command. (204) Baccalaureate degree in Military Science. In addition, the student is required to enlist in the U.S. Army Reserve. This enrollment may be canceled if the student withdraws from the University or for other specific reasons.

PRINCIPLES AND TECHNIQUES OF THE MILITARY LEADER 3. (301) Principles and techniques of the military leader with emphasis on leadership and military training, leadership and command, leadership and prolog lines, leadership and planning in tactical operations, leadership and command, and leadership and training in small unit operations. Continuation of leadership, drill and command. (302) Principles and techniques of tactical operations with emphasis on small unit operations. Continuation of leadership, drill and command.

SUMMER CAMP. No credit. Six weeks at a Army Training Center taken after completion of the complete camp period by providing the cadet practical experience and instruction in tactical and technical subjects with specific emphasis on leadership development. Cadet is reimbursed for travel to and from camp at the rate of $6 per mile, and receives pay of $269.50 for the complete camp period.

MILITARY TEAM 3 prereg 301-302-303. (401) Military administration and logistics with emphasis on duties and functions of Army staff officers. Leadership, drill and command with practical application and exercises designed to develop the junior officer. (402) Military operational techniques with emphasis on functions of staff officers. Continuation of leadership, drill and command. (403) A survey of world change and military implications. Military law.

FLIGHT TRAINING. No credit. This elective is offered to selected qualified students concurrent with 401, 402, and 403. Successful completion of completion of FAA Private Pilot license and assignment to Army Aviation duty upon graduation.

TWO-YEAR PROGRAM

The two year program requires attendance at two summer camps and the two years of the Army ROTC Advanced Course. Admission into the Advanced Course under this program does not require the two years of Basic ROTC as a prerequisite. In lieu of that, it is required that students complete an 18-week summer camp at a U.S. Army training facility during the summer immediately prior to entering the Advanced Course. The two year program is identical to the four year program. Students who have completed the two years of the Army ROTC program through the two year program should consult the Professor of Military Science no later than winter quarter of their sophomore year.

SUMMER CAMP. No credit. Prerequisite for entry into Advanced Course, two-year program. Six weeks at a Army facility. The camp brings the student to a level of military training and education which will qualify him for enrollement in the Advanced Course. Student is reimbursed for travel to and from camp at the rate of $6 per mile and receives pay of $172.80 for the complete camp period.

PRINCIPLES AND TECHNIQUES OF THE MILITARY LEADER 3. (Same as for the four year program.)

CAMP. (Same as for the four year program.)

FLIGHT TRAINING. (Same as for the four year program.)

SOCIAL WELFARE explores the ways in which social problems affect people; the agencies which help people deal with these problems; and the methods used in such endeavor. Social Welfare courses involve case records and some field work or observation in addition to regular class work. Broad studies in other social sciences are recommended.

Those seriously considering a career in the field should plan for the two years of graduate professional training for which the course is preparatory. Social workers are employed in such positions as instructors, social workers, group workers, supervisors and administrators in public and private social agencies, courts, hospitals, mental-health clinics and youth-serving organizations.

The undergraduate major in social welfare is available for those who wish: (1) prepare for employment in the social services; (2) prepare for entry into a graduate school of social work; (3) prepare for graduate education in related helping professions; (4) prepare for intelligent and informed citizen participation in the solution of social problems.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation for the Bachelor of Arts degree with a major in social welfare, the following courses must be taken: SW 101 and 200. In addition, Soc. 101 and 201 or an acceptable equivalent in the area of social research must be taken. Students are urged to take a wide variety of courses in the social and behavioral sciences. English 100 and 200 are required. Students scoring at or above the 93rd percentile on the ACT English examination will be exempt from this requirement. Those at or below the 91st percentile must pass English 101 or enter English 100. Students who demonstrate in departmental course work substantial proficiency may be required to take additional courses in English. Liberal arts students preparing for careers in the helping professions are advised to take courses in the social sciences.
cessfully complete the following requirements: SW 181, 200, 340-341-342, 499 (12 credits); Anth 158; Soc 207; Speech Comm 110; and Psych 205 or Hist 266 or 268. The completion of the Social Work Sequence is not required for students who wish a degree with a major in social welfare. It is an optional sequence available for social welfare majors and graduate students in behavioral and social sciences. Social welfare credits earned as a part of the Social Work Sequence may be counted toward a major in social welfare.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

181 THE FIELD OF SOCIAL WELFARE 5. The range of social welfare activities and programs; basic value orientations as the organizing interests for the development of social welfare programs; the goals and relative efficiency of selected programs; and the relationship of the field of social welfare and the social work profession.

200 INTRODUCTION TO SOCIAL WORK PRACTICE 4 prereq 181. Social work as a professional practice concerned with helping individuals, groups, and communities; its goals, guiding philosophy, and basic assumptions. Major processes in social work practice.

FOR UNDERGRADUATES AND GRADUATES

340-341-342 SOCIAL WORK INTERVENTION 3 prereq 200. Theoretical, conceptual, and practical considerations for social work practice with different client populations. Requirements for successful intervention directed toward development of specific capabilities of the behavior of: (340) individuals, (341) small groups, (342) complex organizations.

344 SOCIAL WELFARE POLICY AND SERVICES 4 prereq 181. Historical, philosophical, and comparative review of social welfare systems in the United States and other countries. The nature and adequacy of different social welfare programs and services and major issues in social policy planning.

346 SELF ENCOUNTER AND PERSONAL GROWTH 4 prereq c/i. Utilization of small group interactional processes in developing individuals' self-knowledge, acquiring greater awareness of others, and identifying personal growth needs.

348 MANAGEMENT AND USE OF INFORMATION IN SOCIAL WORK 4 prereq 200. Basic skills necessary for social work practice in a wide variety of settings, including interviewing, data recording and retrieval techniques, and data analysis in relation to intervention planning.

374 THE ADMINISTRATIVE PROCESS IN SOCIAL WORK PRACTICE 3 prereq 200. Responsibilities of staff, executive, and board in defining and carrying out agency or department purposes and functions. The roles of the administrator, supervisor, and worker in the administrative process in relation to the social, cultural, psychological, and political forces operating in social welfare administration. The relationship of administration to policy making, community planning, and social action. Personnel methods and standards.

471-472-473 SOCIAL WORK PRACTICE IN SPECIAL SETTINGS V R-12 prereq 200. Field experiences in selected institutions, local agencies, and with particular handicaps, and school social work, including, in each case, examination of requisite specialized skills and knowledge, value systems, and fundamental principles of inter-personal communication.

483 SOCIAL WORK LABORATORY V 2-4 R-12 prereq 181. A program of self-help project experiences in dealing with community needs and resources. Theoretical analysis of experienced situations. Learning by means of the laboratory methods.

485 INDEPENDENT STUDY V 1-2 R-6 prereq c/i.

489 SEMINAR V R-9 a/y prereq 15 credits in social welfare.

499 FIELD WORK PRACTICUM V R-12 prereq 181, 200, and either previous completion or concurrent enrollment in 340, 341, or 342; concurrent enrollment in 489, Practicum Seminar, is also required. Field work or internship, under supervision, in public and private agencies and institutions.

502 ADVANCED RESEARCH METHODS (see Sociology)

Courses 530, 549, 550, 559, 560, 570 will be offered only by off-campus extension.

530 ADVANCED SOCIAL WORK THEORY 4 prereq graduate standing.

540 THE SUPERVISORY PROCESS IN SOCIAL WORK 4 prereq experience in social welfare work and graduate standing.

550 BEHAVIORAL AND SOCIAL SCIENCE CONCEPTS FOR SOCIAL WORK 4 prereq graduate standing.

560 ADVANCED SOCIAL WORK INTERVENTION 4 prereq graduate standing.

570 TOOLS OF SOCIAL WELFARE PLANNING 4 prereq graduate standing.

599 FIELD WORK PRACTICUM (see Sociology).

SOCIOLOGY

is a social science concerned with relationships which link man with his institutions and his society. Sociology is also a profession which offers various services to business, governmental, and other agencies seeking help in developing desired relationships among their members. The degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy are offered in sociology.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, the following sociology courses are required for the Bachelor of Arts degree. A foreign language proficiency is required. (See foreign language requirement in the general section of the catalog.) The 45 credits in sociology must include the following courses: Soc 101, 201, 207 or 208, 310, 401 and 402. In addition, Anthropology 153 and one upper division Anthropology course must be taken. Students must take Math 201 or be exempt through examination. Students planning to undertake graduate work should also take Sociology 205 and 314 and Anthropology 572. English 100 and 108 are required. Students scoring at or above the 85th percentile on the ACT English examination will be exempt from this requirement. Those at or below the 31st percentile must pass English 201 before entering English 100. Students who demonstrate in departmental course work substantial proficiency in English may be required to take additional courses in English composition.

COMBINED MAJOR. For the combined major leading to the degree of Bachelor of Arts in Sociology and Economics the following general requirements must be completed: Soc 204 and at least 12 additional credits of upper division sociology, including 301, 311, and at least 12 additional upper division economics of credits.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101 INTRODUCTORY SOCIOLOGY 5.

102 SOCIAL PROBLEMS 5.

200 AMERICAN SOCIETY 5 prereq 5 credits in sociology or c/i. Structure and function of contemporary American society.

201 (303) SOCIAL SCIENCE METHODS 5 prereq 10 credits in social sciences. The methodology, techniques and instruments of measurement used in the social sciences.

204 COURTSHIP AND MARRIAGE 2. Factors in courtship and marriage. (Credit not allowed toward a degree in sociology.)

205 ELEMENTARY SOCIAL STATISTICS 5 prereq Math 1001 or exemption by examination and 5 credits in sociology or c/i. Simple statistical and graphic techniques commonly used in the social sciences.

207 INTRODUCTION TO SOCIAL CHANGE 5 prereq 5 credits in sociology or c/i. Analysis of creation and development of social organizations and relationships.

208 (301) INDIVIDUAL AND SOCIETY 5 prereq 5 credits in sociology or c/i. Human development through interaction of social structure, heredity, and culture.


403 INDEPENDENT STUDY V 1-2 R-6 prereq c/i.

FOR UNDERGRADUATES AND GRADUATES

302 SOCIAL STRATIFICATION 3 a/y prereq 10 credits in sociology or c/i. The class system in contemporary society in terms of social class theory, class behavior, and current research in social stratification in American society.

304 POPULATION 4 prereq 10 credits in social sciences. A quantitative and qualitative analysis of world population; vital statistics and population change; migration and immigration.

305 (402) THE FAMILY 5 prereq 10 credits in sociology or c/i. Comparative, historical and analytical study of the family.

306 CRIMINOLOGY 5 prereq 10 credits in sociology or c/i. The causes, prevention, detection, and correction of crimes.

307 SOCIALIZATION 3 prereq 10 cr. in Sociology including 208 or c/i. Processes and products of social learning.

308 RACE AND ETHNIC RELATIONS 3 a/y prereq 101 and Anth 354. Racial and ethnic differentiation and its social consequences. (Credit not given for both Soc 308 and Anth 354.)

309 INTRODUCTION TO COMPLEX ORGANIZATIONS 4 prereq 10 credits in sociology or c/i. Bureaucracies and bureaucratization in modern society.

310 DEVELOPMENT OF SOCIAL THOUGHT 5 prereq 10 credits in sociology or c/i. Social thought from earliest times to the establishment of sociology.

311 (S W 281) JUVENILE DELINQUENCY 5 prereq 10 credits in sociology or c/i. Nature and extent of the problem. The role of courts, social agencies, and schools in its prevention and treatment.
SPEECH COMMUNICATION is that branch of the behavioral sciences concerned directly with human message systems. Courses in speech communication emphasize theoretical conceptions of the nature, production, use, and role of messages in life and society, and applications of these conceptions to interpersonal, public and organizational communication.

Undergraduates are awarded the Bachelor of Arts degree in Speech Communication, but may select one of several emphases, depending upon their interests. Students interested in teaching may select either the Teaching Communication Skills emphasis or the Speech Communication Education emphasis; students interested in entering business, industry, government or graduate school, and/or desiring a liberal arts background, may select the Special Communication emphasis.

Graduate students are awarded a Master of Arts degree or a Master of Speech Communication degree (see Graduate Bulletin).

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, the student must complete a minimum of 45 credits and not more than 70 credits in Speech Communication. All students majoring in this department are required to complete a core of courses prior to entering the department. The specific requirements for these courses are listed below:

SPEECH COMMUNICATION

**FOR GRADUATES**

**SPEECH COMMUNICATION EDUCATION**
TEACHING COMMUNICATION SKILLS

Freshman
- Engl 100—Lower Division Composition Cr.
- SpCo 110—Introduction to Systems of Communication 5
- SpCo 112—Argumentation 5
- SpCo 119—Practicum in Oral Expression 5

Sophomore
- SpCo 224—Introduction to Communication: Process 5
- Jour 270—Reporting 5
- Engl 300—Upper Division Composition 5

Junior
- SpCo 314—Discussion and Small Groups 3
- SpCo 335—Message Composition 3
- SpCo 333—General Semantics 3
- SpCo 386—Speech Criticism 3

Senior
- Engl 371—Structure of Modern English 3
- Jour 316—School Publications 3
- Jour 335—Magazine Article Writing 3
- Engl 352—Creative Writing 3
- SpCo 444—Rhetorical Theory 3
- SpCo 443—Advanced Public Speaking 3
- Engl 450—Advanced Composition 3
- Educ 421—Methods of Teaching Communication Skills 3

Note: Course requirements in Education to meet teacher certification are listed under Education.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

110 INTRODUCTION TO SYSTEMS OF COMMUNICATION 5. Theory and evidence relevant to interpersonal and intrapersonal systems of communication. The role of language in human interaction.

111 INTRODUCTION TO PUBLIC SPEAKING 3. The theories and principles of public speaking. Practice in preparation, delivery and criticism of speech.

112 ARGUMENTATION 5. The principles by which belief and conduct are influenced through appeals to logical reasoning. Evidence, analysis, logic, fallacies, refutation and their application to current economic, social and political problems.

115 PERSUASIVE COMMUNICATION 4. Attitude and behavior modification primarily by oral communication.

118 PRACTICUM IN ORAL EXPRESSION 3 (2-3). Principles of vocal expression, articulation and diction, with practical application through recording and evaluation.

119 PHONETICS 2 (2-1). (See Speech Pathology and Audiology.)

222 (122) PUBLIC SPEAKING PRACTICUM 5 (0-4) preq 111. Practice in speech composition, delivery and criticism beyond that introduced in Speech-Communication 111.

223 INTRODUCTION TO COMMUNICATION: PHONOLOGY 5 (4-2). (See Speech Pathology and Audiology.)

233 INTRODUCTION TO COMMUNICATION: AUDIOLOGY 5 (4-2). (See Speech Pathology and Audiology.)

234 INTRODUCTION TO COMMUNICATION: PROCESS 5 (5-0). Major concepts and principles relevant to the nature and use of signs and symbols in the total process of communication, with particular reference to meaning.

265 FORENSICS 1 R-4. Preparation of debates, orations, extemporaneous and impromptu speeches, and other types of public address.

301 HISTORY OF THE FIELD OF COMMUNICATION 3. The major lines of influence leading to present theories, concepts and methods in the field of oral communication.

313 CONFERENCE LEADERSHIP 2. Methods and procedures of conducting meetings, including the use of parliamentary procedure.

314 (214) DISCUSSION AND SMALL GROUPS 3. The processes involved in informal small-group interaction. Includes theory and evidence related to concepts of leadership, communication patterns, group cohesion and social pressure.

316 COMMUNICATION IN ORGANIZATIONS 4. Intra-organizational problems. Theory and research on questions of informational and directive communication as related to such factors as channels, structures, status, involvement, morale.

335 COMMUNICATION DISORDERS I 5 (5-1) preq 119, 223, 223, and 234. (See Speech Pathology and Audiology.)

336 COMMUNICATION DISORDERS II 5 (5-1) preq 335. (See Speech Pathology and Audiology.)

377 COMMUNICATION DISORDERS III 3 (3-1). (See Speech Pathology and Audiology.)

351 DEVELOPMENTAL SEMIOLOGY 3 preq 118, 232, 233, 234. (See Speech Pathology and Audiology.)

353 GENERAL SEMANTICS 3. The influence of language and language habits on perception, evaluation and decision; particular attention to the concepts of structure and meaning.

355 MESSAGE COMPOSITION 3 preq 111. Preparation of oral messages, with emphasis on organization and language choice.

356 SPEECH CRITICISM 2. The bases upon which the various forms of public speaking are evaluated.

361 (261) ORAL INTERPRETATION 3 (2-3). The analysis and oral presentation of literature.

371 SOCIOGRAMA 3. Principles and practice of role-playing as a technique of communication.

383 LANGUAGE AND CULTURE 3. (See Anthropology.)

FOR UNDERGRADUATES AND GRADUATES

419 ADVANCED PHONOLOGY 3 a/y. (See Speech Pathology and Audiology.)

450 MOTOR AND PERCEPTUAL PHONETICS 4 (3-2) a/y. (See Speech Pathology and Audiology.)

462 (421) TEACHING SPEECH IN THE SECONDARY SCHOOL 3 preq 15 credits in Speech Communication. Planning the speech curriculum and its relationship to other school subjects; instructional materials and methods of teaching speech.

491 (343) ADVANCED PUBLIC SPEAKING 3 preq 111 and 385 or c/l.

494 (344) RHETORICAL THEORY 3. The historical development and current status of rhetorical theory.

495 HISTORY OF AMERICAN PUBLIC ADDRESS 3 preq c/l. Critical analyses of speeches of historically prominent American speakers and issues with which they were identified.

496 HISTORY OF BRITISH AND EUROPEAN PUBLIC ADDRESS 3. Critical analysis of speeches of historically prominent British and European speakers and the issues with which they were identified.

513 PSYCHOLINGUISTICS 3 a/y preq 234. Recent theories and evidence concerned with the empirical analysis of linguistic behavior. (Credit not allowed for this course and SPA 451.)

462 DIRECTING THE FORENSIC PROGRAM 3. Philosophy, organization, and administration of competitive speech activities.

469 (369) ADVANCED ORAL INTERPRETATION 3 preq 361 or c/l.

480 LINGUISTIC METHODS 3. (See Anthropology.)

490 PROBLEMS V R-6.

497 INTRODUCTION TO GRADUATE AND PROFESSIONAL PROGRAMS 2 preq 15 credits of junior and senior level Speech-Communication or c/l. The basic approaches to graduate and professional activities.

FOR GRADUATES

511 THEORIES OF COMMUNICATION 3 preq c/l. A critical evaluation of theories and research in the field of communication.

512 ORGANIZATIONAL COMMUNICATION 3 preq c/l.

514 SMALL GROUP COMMUNICATION 3 preq c/l.

519 SEMINAR: COMMUNICATION MEASUREMENT 3 preq Statistics.

521 INFORMATION AND COMMUNICATION 3 preq c/l. The nature and function of information in human communication systems.

522 SEMINAR: SPEECH COMMUNICATION EDUCATION 3. preq 422 or c/l.

541 PERSUASION 3 preq c/l. Theories and research concerned with the processes by which behavioral and attitudinal change are produced primarily by communication.

545 SEMINAR: SPEECH CRITICISM 3 a/y preq c/l.

551 CONTEMPORARY PUBLIC ADDRESS 3 a/y preq c/l.

553 SEMINAR: HISTORY OF RHETORIC AND PUBLIC ADDRESS 3 a/y preq c/l.

571 SOCIOGRAMA 3 a/y c/l.

588 COMMUNICATION PRACTICES 3. (See Business Administration)

597 RESEARCH METHODS AND MATERIALS 5 preq Statistics. Principles and techniques of quantification and design in communication research. Practice in the techniques of professional writing.

599 TOPICAL SEMINAR V R-9 preq c/l.

600 RESEARCH V R-10 preq c/l.

699 THESIS V R-12.
SPEECH PATHOLOGY AND AUDDIOLOGY

represents an integration of disciplines among social and life sciences concerned with the processes by which people communicate and with difficulties arising in these processes. Study in this field is designed to provide a deeper understanding of the processes, resources, facilities and disabilities of human communication.

Although students take the Bachelor of Arts degree in Speech Pathology and Audiology, this is a professional degree and is not intended to prepare a student for employment in the field. For students intending to engage in professional clinical work, it is recommended that requirements for clinical certification by the American Speech and Hearing Association be met. Persons receiving the degree, Master of Speech Pathology and Audiology, meet all requirements for a Certificate of Clinical Competence; persons receiving the Master of Arts degree in Speech Pathology and Audiology may or may not meet certification requirements depending on their professional goals. Professional employment opportunities for persons receiving graduate degrees in Speech Pathology and Audiology include clinical service centers, hospitals, public schools, health departments, colleges and universities, industrial programs, research centers, and private practice.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, the student must complete a minimum of 45 credits and not more than 70 credits in Speech Pathology and Audiology. All students majoring in the Speech Pathology and Audiology program are required to complete a core curriculum as follows:

Compulsory course: Speech Communication 119, 232, 233, 336, 338, 337, 338, 341, 342, 351, 380, and 423 (4 credits); Anthropology 152 or 153; English 300 or Speech Communication 386; Sociology 101; Psychology 110 and 212; Zoology 202; and 5 credits each in Normal Development of the Child Philosophy and Statistics.

SUGGESTED PROGRAM FOR UNDERGRADUATES

Freshmen

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<td>Soc 101</td>
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<tr>
<td>Philosophy</td>
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<tr>
<td>Psych 110</td>
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<td>Soc 102</td>
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<tr>
<td>SPA 100, 101</td>
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Sophomore

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>English Composition</td>
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<td>Zoology 202</td>
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<td>SPA 119</td>
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<td>SPA 332, 323, SpCo 234</td>
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<td>Physical Sci</td>
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<td>Soc or Anthro</td>
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<td>Psych 420</td>
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<td>Math 125</td>
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Junior

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Humanities (in addition to Philosophy)</td>
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<td>SPA 335, 326, 338</td>
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<td>SPA 341, 342</td>
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<td>SPA 380</td>
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<tr>
<td>SPA 331, SpCo 383</td>
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<td>SPA 423</td>
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Senior

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>SPA 337</td>
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<td>Psych 320 or Soc 205</td>
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<tr>
<td>Electives</td>
<td>9-11</td>
<td>12-14</td>
<td>15-17</td>
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<tr>
<td></td>
<td>14-16</td>
<td>15-17</td>
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</tr>
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</table>

GRADUATE WORK. See Graduate Bulletin.

FOR UNDERGRADUATES

100 ORIENTATION TO SPEECH PATHOLOGY AND AUDIOLOGY I 1 (1-1) preq c/l. Orientation to history and current development of field of Speech Pathology and Audiology with supervised observations in University Speech and Hearing Clinic.

101 ORIENTATION TO SPEECH PATHOLOGY AND AUDIOLOGY II 1 R-3 (1-1) preq SPA 100. Principles of observation and participating along with participation in clinical activities as assistant to clinicians.

119 PHONETICS 2 (2-1). Transcription (International Phonetic Alphabet) and standards of pronunciation and dialect.

223 INTRODUCTION TO COMMUNICATION: PHONOLOGY 5 (4-2). Phonological, psychological, sociological, and cultural determinants of the production and perception of signs in human communication, with special reference to the production of language.

224 INTRODUCTION TO COMMUNICATION: ACOUSTIC AND PHYSIOLOGICAL ASPECTS 5 (4-2). Theories, research and selected remedial procedures relating to the production and reception of signs in human communication, with special reference to the reception and perception of language and other acoustic stimuli.

234 INTRODUCTION TO COMMUNICATION: PROCESSES. See Speech Communication.

330 INTRODUCTION TO SPEECH PATHOLOGY 3 (3-1). For non-majors. Speech and language problems commonly encountered in the classroom. (Non-majors may take for graduate credit.)

333 COMMUNICATION DISORDERS I 5 (5-1) preq 119, 232, 233. Theories, research and selected remedial procedures relating to receptive and expressive aspects of disorders of articulation and language.

336 COMMUNICATION DISORDERS II 5 (5-1) preq 335. Theories, research and selected remedial procedures relating to disorders of language, rhythm, fluency and voice.

337 COMMUNICATION DISORDERS III 3 (3-1). Psychosocial problems of communication including those language problems associated with emotional mental disorders, personal adjustment problems, and socio-cultural differences between speakers and listeners.

338 (327) CLINICAL PROCEDURES FOR COMMUNICATION DISORDERS 3 (3-1) preq 336 or c/l. Principles and methods of habilitation and rehabilitation for children and adults with communication disorders.

341 (321) DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS I 2 preq or cor 325. Clinical experiences with tools and techniques needed to assess and diagnose speech and hearing problems of the adult and child.

342 (323) DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS II 2 (4-0) preq 341. Supervised clinical practice in the out-patient clinic.

351 DEVELOPMENTAL SEMIOLOGY 3 preq SPA 119, 232, 233; SpCo 234. Characteristics and determinants of the sign process associated with the main stages in human development through the life span.

350 (340) CLINICAL AUDIOLOGY 3 (3-1) preq 233. Fundamental principles related to the measurement of hearing. Psychosocial problems and clinical techniques employed with the acoustically handicapped.

FOR UNDERGRADUATES AND GRADUATES

419 ADVANCED PHONOLGY 3 a/y. Intonational and phonological systems of language.

420 MOTOR AND PERCEPTUAL PHONETICS 4 (3-2) a/y. Analysis and synthesis of voice, speech and hearing mechanisms.

423 (333) CLINICAL PRACTICUM 1-3 (0-2) R-4 preq 338 and 341. Thirty clock hours per credit of supervised clinical practice in the Speech and Hearing Clinic.

431 (351) STUTTERING 3 (3-1) preq 336. Stuttering as learned behavior; emphasis on prevention and habilitation.

432 (352) ORGANIC DISORDERS OF COMMUNICATION I 3 (3-1) preq 336 and 341. Theories, research and therapeutic procedures for problems of communication associated with anomalies in anatomical structure.

433 (353) ORGANIC DISORDERS OF COMMUNICATION II 3 (3-1) preq 336 and 341. Theories, research and therapeutic procedures for problems of communication associated with neurological disorders.

435 METHODS OF SPEECH AND HEARING THERAPY IN THE SCHOOL 2 preq 336. Methods and policies related to establishing and conducting a speech and hearing program in a school system with emphasis at the elementary level.

437 LANGUAGE DISORDERS IN CHILDHOOD 4 (3-2). Evaluative techniques, remedial and habilitative approaches to deviant language behavior in children.

451 PSYCHOLINGUISTICS 3 a/y preq SpCo 234 and Engr 360. Recent theories and evidence concerned with the empirical analysis of linguistic behavior. (Credit not allowed for both SPA and SpCo 451.)

471 COMPARATIVE SEMIOLOGY 3 a/y preq Zool 111-112-113 or c/l. The sign process based on evidence and observation at selected levels of the phyletic scale.
WILDLIFE BIOLOGY—77

The Wildlife Honors curriculum is designed particularly for students with strong academic records who intend ultimately to work toward a doctorate. Entrance into this option is open only to students at the beginning of their junior year who have a 3.0 GPA and who petition the staff for entrance.

This university is particularly well suited for instruction in this area of learning because of the excellent opportunities for field instruction and research, and the presence of such facilities as the Biological Station, the Montana Forest and Conservation Experimental Station, and the Montana Cooperative Wildlife Research Unit.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University the student should elect four years of mathematics in high school.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN WILDLIFE BIOLOGY. In addition to the general requirements for graduation listed earlier in the catalog the student must complete the requirements as listed for one of the three options indicated below. Note that a study of foreign language is required only in the Wildlife Honors option.

CURRICULA IN WILDLIFE BIOLOGY

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Botany-Zoology 111—General Zoology</td>
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<tr>
<td>Botany 114, 115—General Botany</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 101, 102, 103—General Survey, Organic</td>
<td>4</td>
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<tr>
<td>English 101—Lower Division Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 110—College Algebra, Trigonometry</td>
<td>3</td>
</tr>
<tr>
<td>Zool-Bot-For 170—Survey of W.L. Careers</td>
<td>1</td>
</tr>
<tr>
<td>Group Requirements and Electives</td>
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<tr>
<td>HPER—Physical Education</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zool 113, 114—General Zoology</td>
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<tr>
<td>Bot 235, 236—Plant Physiology, Systematic Botany</td>
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<tr>
<td>Math 125—Statistics</td>
<td>0-5</td>
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<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Bot-Zool 250—Basic Concepts of Ecology</td>
<td>2</td>
</tr>
<tr>
<td>Bot-Zool 251—Ecology Lab</td>
<td>2</td>
</tr>
<tr>
<td>Physics 111, and 112 or 113—General Physics</td>
<td>5</td>
</tr>
<tr>
<td>Group Requirements and Electives</td>
<td>0-2</td>
</tr>
<tr>
<td></td>
<td>3-3</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zool 309, 310—Mammalogy, Ornithology</td>
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<tr>
<td>Zool 321—Human Physiology</td>
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<tr>
<td>For 300—Range Management</td>
<td>4</td>
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<tr>
<td>For 220—Technical Writing</td>
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<tr>
<td>or</td>
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<tr>
<td>Eng 300—Upper Division Composition</td>
<td>3</td>
</tr>
<tr>
<td>Group Requirements and Electives</td>
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Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>For 470, 471, 472—Advanced Wildlife, Big Game, Habitat</td>
<td>5</td>
</tr>
<tr>
<td>Bot 355—Plant Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Zool* 331—Comp. Physiology</td>
<td>5</td>
</tr>
<tr>
<td>Zool 410—Advanced Animal Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Zool 405—Animal Behavior</td>
<td>5</td>
</tr>
<tr>
<td>Zool 300—For 491, 492, 493—Sr. Wildlife Seminar</td>
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<tr>
<td>Group Requirements and Electives</td>
<td>4-7</td>
</tr>
<tr>
<td></td>
<td>14-17</td>
</tr>
</tbody>
</table>

*Zool 340, 341 may be elected in place of Zool 202, 331.

WILDLIFE BIOLOGY

is the study of wild vertebrate animals and their conservation. It is based on the natural sciences, with particular emphasis in the biological sciences. The undergraduate curriculum described herein, constitute prerequisites to the physical science courses for the freshman year and pursue different curricula for the next three years. Each leads to the Bachelor of Science in Wildlife Biology.

Very few employment opportunities exist in wildlife management and research for holders of the Bachelor's Degree. Wildlife Biology students should plan to continue their education, at least through the Master's Degree, in order to qualify for state and federal wildlife management and/or research positions.

Within the broad designation of Wildlife Biology there are three optional curricula: Terrestrial, Aquatic and Honors. As indicated below, Terrestrial and Aquatic curricula prepare the student for future employment in fish and game conservation.

### Terrestrial Option

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zool 113, 114—General Zoology</td>
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<tr>
<td>Bot 325—Plant Physiology</td>
<td>5</td>
</tr>
<tr>
<td>Chem 123—Qualitative Analysis</td>
<td>5</td>
</tr>
<tr>
<td>Math 125—Statistics</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
<td>0-3</td>
</tr>
<tr>
<td>Bot-Zool 250—Basic Concepts of Ecology</td>
<td>2</td>
</tr>
<tr>
<td>Bot-Zool 251—Ecology Lab</td>
<td>2</td>
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<tr>
<td>Physics 111, and 112 or 113—General Physics</td>
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<td>Group Requirements and Electives</td>
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### Aquatic Option

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>Zool 113, 114—General Zoology</td>
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<tr>
<td>Bot 325—Plant Physiology</td>
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<tr>
<td>Chem 123—Qualitative Analysis</td>
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<td>Math 125—Statistics</td>
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<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
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<td>Bot-Zool 250—Basic Concepts of Ecology</td>
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<td>Bot-Zool 251—Ecology Lab</td>
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<td>Physics 111, and 112 or 113—General Physics</td>
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<td></td>
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</tr>
</tbody>
</table>

*Zool 340, 341 may be elected in place of Zool 202, 331.

### Honors Option

(SpCo 111 and/or Eng 300 could be taken Spring Junior Year.)
### Junior Year
#### Aquatic Option

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Zool 319—Ichthyology</td>
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<tr>
<td>Zool 330, 331—Cellular and Comp. Physiology</td>
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<tr>
<td>Chem 245—Quantitative Analysis</td>
<td>5</td>
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<tr>
<td>Bot 205—Plant Ecology</td>
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<tr>
<td>Bot 285—Systematic Botany</td>
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<tr>
<td>For 285—Hydroligic Principles</td>
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</tr>
<tr>
<td>For 292—Principles of Technical Expression</td>
<td>0-2 0-2</td>
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<tr>
<td>Engl 300—Upper Division Composition</td>
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#### Group Requirements and Electives

<table>
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<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>16-18</td>
</tr>
<tr>
<td>16-18</td>
</tr>
<tr>
<td>15-18</td>
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</tbody>
</table>

One summer at the University of Montana Biological Station (or other Biological Station) enrolled in Zoology 461, Limnology, and one of the following three courses: Zoology 366, Aquatic Insects, Botany 386, Aquatic Flowering Plants, Bot 441 Physiology. This summer could be taken either after the junior or the senior year. Suggested electives: Any courses from list of appropriate additional courses shown below:

### Senior Year
#### Aquatic Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Zool 366—Aquatic Insects</td>
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<tr>
<td>Zool 413—Fisheries Science</td>
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<tr>
<td>Zool 428—Invertebrate Ecology</td>
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<tr>
<td>Bot* 441—Phylogeny</td>
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<td>Zool 460—Animal Behavior</td>
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<td>Bot, For 491, 492, 493—Senior Wildlife Seminar</td>
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#### Group Requirements and Electives

<table>
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<td>5-8</td>
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</tbody>
</table>

*Bot 441 could be taken at the Biological Station during the preceding summer.

### Wildlife Honors Option

#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zool 485—Genetics</td>
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<tr>
<td>Engl 300—Upper Division Composition</td>
<td>0-3 0-3</td>
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<tr>
<td>For Lang* 101, 102, 103—Spanish, French, German, Russian</td>
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</tr>
<tr>
<td>Advanced courses from selected list below</td>
<td>5-8 10-13 10-13</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>For Lang* 211, 212—French, German, Russian,</td>
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<tr>
<td>Spanish</td>
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<tr>
<td>Zool, Bot, For 491, 492, 493—Senior Wildlife Seminar</td>
<td>1 1 1</td>
</tr>
</tbody>
</table>

*The language requirements for the Honors Option (Bachelor of Science degree) are the same as described earlier in the catalog.

### ZOOLOGY

ZOOLOGY is the study of animals—how they are put together, how their bodies work, and how they adjust to their surroundings. It is a basic science for many professional fields such as medicine, pharmacy, wildlife, and physical education.

In addition to the Bachelor's degree, the Master of Arts (or Master of Science) and the Doctor of Philosophy degrees are offered.

Undergraduate courses involve much laboratory work as well as opportunities for field work. During the summer extensive field experience is available at the Biological Station maintained on Flathead Lake for qualified upperclass and graduate students.

Graduates become high school teachers or, after advanced studies, instructors in colleges and universities. Others enter state or federal government service in health and conservation agencies. Many, with further training, enter medicine or related fields. A few establish themselves as fish culturists, fur farmers, pest control experts, and so on.

### SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN ZOOLOGY

In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed for the Bachelor of Arts degree with a major in Zoology: Zool 111, 112, 113, 429, and at least one course from each of the following 6 groups:

*Students may substitute Chem 301, 202 for either group 3 or 4.

The following must also be completed: Botany 111-112; Chemistry 121-122-123; Mathematics 116, 117, 118; Physics 111-112-113 or 121-122-123; English 100 and 300. English 400 recommended.

The foreign language requirement listed earlier in the catalog must be satisfied. Normally Zoology majors take 5 quarters of French, German or Russian. Other languages or combinations must be approved by the department.

The Pre-medical Sciences student may earn a degree in Zoology by completing requirements in that curriculum and presenting a total of 35 credits in Zoology or related fields as follows: Zool 111, 112, 113, 404, 485; any one course from Zool 206, 308, 310, 311, 391, 385, 386, 410, 428, 481; any one course from Microbiology or Zoology or Botany or one course from Zool 203, 304, 305, 313, 322, 324, 344, 341.

Senior examinations are given only to candidates for honors.

### GRADUATE WORK.

See Graduate School Bulletin.

### SUGGESTED CURRICULUM IN ZOOLOGY

#### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>English 100—Lower Division Composition</td>
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</tr>
<tr>
<td>Math 116, 117, 118—College Algebra, Trigonometry and Introduction to Calculus</td>
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</tr>
<tr>
<td>Zoology 111, 112, 113—Introduction to Biology, General Zoology</td>
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<tr>
<td>Group requirements</td>
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<td>HPER 100—Physical Education</td>
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#### Sophomore Year

<table>
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<tr>
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<tbody>
<tr>
<td>Chem 121-122-123—College Chemistry</td>
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<tr>
<td>Foreign Language 101-102-103—Elementary French, German or Russian</td>
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<td>Electives</td>
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<tr>
<td>Group requirements</td>
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#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>English 300—Upper Division Composition</td>
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<tr>
<td>Foreign Language 211-212—French, German, or Russian Readings</td>
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</tr>
<tr>
<td>Physics 111-112-113 or 221-222-223—General Physics</td>
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<td>Zoology Advanced Courses</td>
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<td>Group requirements</td>
<td>0-3 0-3 2-4</td>
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</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Botany 114, 115—General Botany</td>
<td>5 5 5</td>
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<tr>
<td>Zoology 429—Biological Literature</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Zoology Advanced Courses or Chem 261, 262</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Electives</td>
<td>9-10 9-10 7-8</td>
</tr>
</tbody>
</table>

#### Statistics

1. Wed, 2:00-3:30, Ball Hall 204
2. Wed, 2:00-3:30, Ball Hall 204
FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)


111 INTRODUCTION TO BIOLOGY 5 (3-4). Basic principles of biology, including aspects of cell structure and metabolism, genetics, origin of life and mechanisms of evolution and adaptation. (Credit not allowed for both Bot 111 and Zool 111.)

112-113 GENERAL ZOOLOGY 5 (3-4) prereq 111 or Bot 111 or =. A comparison of structure, function, and life histories of selected invertebrates and vertebrates. (Generally taken as a sequence including 111, 112-113.)

170 SURVEY OF WILDLIFE CAREERS 1 (1-0) (cross listed as Forestry and Botany 170).

202 HUMAN PHYSIOLOGY 5 (3-4) prereq sophomore standing with a B or higher in an introductory course in the biological sciences. The normal physiology of the human body, including the functions of the respiratory, circulatory, digestive, endocrine, reproductive, and excretory systems. (Credit not allowed for this course and Bot 265.)

206 FIELD ZOOLOGY 3 (2-5) prereq 113. Field trips. (Credit not allowed for this course and Bot 251.)

250 (350) BASIC CONCEPTS OF ECOLOGY 3 (3-0) prereq 1 year of college biology. Ecological principles with emphasis on the ecosystem. (Credit not allowed for this course and Bot 250.)

251 ELEMENTARY ECOLOGY LABORATORY 2 (3-0) or coreq 250. Principles of ecological methodology including teachable materials relevant to the biological sciences. (Credit not allowed for this course and Bot 408.)

284 INVERTEBRATES OF THE INTERMOUNTAIN REGION 3 (3-5) prereq 113. The ecology, taxonomy, and distribution of the invertebrates of the Rocky Mountain area, exclusive of parasites and insects.

365 ENTOLOGY 5 (3-4) Su 6 at Biological Station, prereq 111 or Bot 111. Structure, classification, life histories, distribution, and ecology of insects.

366 AQUATIC INSECTS 4 (3-12) prereq 113. The insect fauna, both immature and adult, in aquatic habitats of Western Montana.

403 BIOLOGICAL ILLUSTRATIONS 2 (3-4) prereq 1 year of biology and skill in using graphics programs. In the preparation of materials relevant to the biological sciences. (Credit not allowed for this course and Bot 408.)

404 (302) VERTEBRATE EMBRYOLOGY 5 (3-4) prereq 394. The developmental stages of vertebrates including embryos and larvae, and some actual field experience in, methods employed in attacking these problems. Field trips.

428 (208) INVERTEBRATE ECOLOGY 5 (2-8) e/prereq 206, Bot 205 or =. Zool 307 or 311, 312 recommended. The distribution and field studies of invertebrates with special emphasis on the invertebrates. Saturday field trips.

429 BIOLOGICAL LITERATURE 1 (2-0) prereq 20 credits in botany or zoology. Students report of literature of the trend in investigation and experimentation in biological fields.

431 PROBLEMS IN VERTEBRATE MORPHOLOGY AND TAXONOMY V 1-5 prereq 25 credits in zoology including adequate background in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

432 PROBLEMS IN VERTEBRATE PHYSIOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

433 PROBLEMS IN VERTEBRATE EMBRYOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

434 PROBLEMS IN VERTEBRATE PHYSIOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Primarily a problems type course involving semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

435 PROBLEMS IN VERTEBRATE PHYSIOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

436 PROBLEMS IN VERTEBRATE EMBRYOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

442 BIOLOGY OF FOREST INSECTS 3 (3-0) prereq Zool 113. Biology and biomics of insects, including structure, function, systematics, ecology, and adaptation. By consideration of insect ecology. Joint listed as Forestry 432 .

443 FOREST INSECT ECOLOGY 3 (3-0) prereq Zool 432. Ecological role of insects significant in the total forest ecosystem; factors which may regulate the distribution and abundance of insects, and the behavioral and ecological components of insect population changes with the natural and cultural 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

453 PROBLEMS IN INVERTEBRATE PHYSIOLOGY V 1-5 prereq 25 credits in zoology including adequate background courses in the subject and c/i. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters.

459 MARINE INVERTEBRATES 3 (3-1) prereq 436, a problem in marine biology. The systematics and ecology of marine invertebrates, with particular emphasis on the invertebrates of the Pacific Coast. (A 3-day trip to coast of Oregon or Washington required.)

611 LIMNOLOGY 6 (5-25) prereq 113 and Chem 123. Ecology of lakes and streams with emphasis on the physical, chemical, and biotic factors which determine their biological productivity.

685 (365) GENETICS 3 (3-4) prereq 113 or Bot 265. The mechanics of heredity, involving molecular and cellular linkage systems, chromosomal aberrations, extra-chromosomal inheritance, and their role in evolution and development. Credit not given for both Zool 485 and Bot 485.

486 (386) EVOLUTION. (See Botany.)
SO-ZOOLOGY

487 CYTOGENETICS 5 (3-2) prereq 485 or =. The structure and design of chromosomes from bacteria to higher organisms. Chromosome behavior and changes and their role in development and evolution. Cross-list with Botany.

490 SEMINAR IN BIOLOGY 1 (2-0). Credit not allowed for this course and Bot 490.

491-492-493 SENIOR WILDLIFE SEMINAR 1 prereq senior standing in Wildlife Biology or Forestry. Reports and discussion by students, faculty, and guests speakers on current topics in Wildlife Biology. (Double-listed as Forestry 491-492-493.)

FOR GRADUATES

500 SEMINAR 1 prereq graduate standing in a biological science.

501 AREAS AND CONCEPTS OF ZOOLOGY 1 prereq graduate standing in Zoology or in Wildlife Biology. An orientation course for all new graduate students in zoology.

502 HISTORY AND DEVELOPMENT OF BIOLOGICAL CONCEPTS 3 (3-0) prereq graduate standing in zoology. Credit not allowed for this course and Bot 502.


504 ADVANCED ANIMAL BEHAVIOR 5 (2-6) prereq 405 or c/l. The causation and function of normal behavior with emphasis on the experimental approach to the study of behavior. Ecological aspects of behavior.

505 ACAROLOGY 5 (3-4) o/y prereq 324 or 365 or c/l. Comparative adaptive morphology, bionomics and current taxonomic concepts.

515 ZOOGEOGRAPHY 4 (3-1) prereq 2 courses in advanced vertebrate zoology. Past and present distribution of animals, with special emphasis on vertebrates. Influence of climate, place of origin, dispersal routes, and faunal composition. Geological and botanical evidences considered.

516 CONCEPTS AND PRINCIPLES OF SYSTEMATIC ZOOLOGY 3 (3-0) o/y prereq 25 hours in zoology including 256 and 485. Selected topics relating to evolution, speciation and the various philosophies influencing systematic zoology.

523 PHOTOBIOLOGY 4 (2-4) prereq 330. The interaction between non-ionizing radiation and biological systems including photosynthesis, vision, photoperiodism, bioluminescence; methods for studying effects of light on plants, animals and microorganisms. (Credit not allowed for this course and Bot 523.)

524 RADIOBIOLOGY 4 (2-4) prereq 330. The influence of ionizing radiation (x-rays, gamma rays, and accelerated particles) on biological systems and the use of radio-isotopes in biology. (Credit not allowed for this course and Bot 524.)

531 (403) COMPARATIVE PHYSIOLOGY-INVERTEBRATE 5 (3-4) prereq Physics 113 or 223, Chem 262 and one animal physiology course. Physiological processes of the organ systems of the major invertebrate phyla in relation to environment.

532 (402) COMPARATIVE PHYSIOLOGY-VERTEBRATE 5 (3-4) prereq Physics 113 or 223, Chem 262 and one animal physiology course. Physiological processes of the organ systems of the five vertebrate classes in relation to environment.

533 (333) ENDOCRINOLOGY 5 (3-4) prereq Zool 113 and one animal physiology course. The physiology of the glands of internal secretion of the vertebrates with a survey of those of the invertebrates.

551 GENERAL ECOLOGY Su 5 (6-15) prereq Bachelor's degree; major preparation in Botany, Biology or Zoology. Community concepts including succession, stratification, periodicity and energy relationships; introduction to population problems.

561 LIMNOLOGICAL METHODS 3 (3-12) prereq 461, Chem 123. Practice in standard procedures employed. Field work.

590 MOLECULAR BIOLOGY SEMINAR 1 R (1-0) prereq graduate standing. Molecular biology and biochemistry. (Cross-listed with Botany, Chemistry, and Microbiology.)

600 ADVANCED ZOOLOGICAL PROBLEMS V 1-5. Students with sufficient preparation and ability pursue original investigations.

685-686-687 ADVANCED MOLECULAR BIOLOGY LABORATORY 1-3 prereq 482 or c/l. Modern biochemically oriented research techniques. (Cross listed as Botany, Chemistry, Microbiology and Pharmacy.)

699 THESIS V R-15.
FACULTY DIRECTORY—83

FIELD, ROBERT W., Ph.D., University of California; Chairman and Professor of Geology

FISCHER, WILLIAM C., B.S., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

FISHER, DAVID M., M.A., Ball State University; Assistant Professor of Speech Communication

FISHER, WILLIAM H., Ed.D., Fisher's College, Columbia University; Assistant Professor of Education

FORSIB, WILLIAM H., B.A., University of Montana; Lecturer in Journalism (part-time)

FORZUMI, PAUL A., Jr., Ph.D., Michigan State University; Assistant Professor of Economics (on leave 1969-70)

FRANDSEN, WILLIAM H., M.A., University of Oregon; Research Associate in Forestry (Faculty Affiliate)

FRAZIER, ABDINNE (Mrs.), B.A., University of California, Los Angeles; Associate in Home Economics (part-time)

FREED, DALE E., B.S., Gustavus Adolphus College; Instructor in Anthropology

FREEMAN, EDMUND L., M.A., Northwestern University; Professor in Religious Studies

FREI, COSBY, Ph.D., University of Washington; Assistant Professor of Political Science

FREEMAN, JAMES R., Jr., Ph.D., University of Minnesota; Assistant Professor of Forestry

FREIT, HARRY W., M.A., University of Montana; Instructor in History

FUNG, ROBERT W., Ph.D., Vanderbilt University; Professor of Religious Studies

FUQUAY, DONALD M., M.S., University of Washington; Research Associate in Forestry (Faculty Affiliate)

GAMMA, ROBERT R., M.S.W., Ohio State University; Professor of Sociology

GARDNER, EARL S., M.F.A., University of Iowa; Assistant Professor of English

GAUTH, ASHER R., Ph.D., Iowa State University; Lecturer in Zoology (Faculty Affiliate)

GECKEL, RICHARD L., M.L.S., University of California, Los Angeles; Head Reference Librarian (Assistant Professor)

GLEASON, FRANK F., B.A., University of Montana; Associate Professor of Forestry (on leave 1969-70)

GIAMARRONI, DON E., B.A., University of Montana; Lecturer in Accounting and Finance (Business Administration) (part-time)

GIANGETTA, LARRY, B.S., Idaho State University; Instructor in Management (Business Administration)

GIBSON, WILLIAM K., M.F.P., University of Montana; Assistant Professor of Forestry

GILBERT, VINDIS M., Ph.D., Cornell University; Professor of English

GILL, JAMES K., B.S., University of Oregon; Assistant Professor of Accounting and Finance (Business Administration)

GILMORE, VIRGINIA, B.S., Simmons College; Librarian, Minuteman Educational Television (Management)

GLASON, HELEN, M.A., Columbia University; Professor Emeritus of Home Economics

GOLD, RAYMOND L., Ph.D., University of Chicago; Professor of Sociology; Research Director and Principal Investigator of Institute for Social Science Research

GOODE, ROBERT B., Ph.D., University of Virginia, Charlottesville; Dean and Professor of Business Administration

GORDON, CLARENCE C., Ph.D., Washington State University; Professor of Zoology

GORMAN, ROBERT E., Ed.D., Indiana University; Director of the Counseling and Testing Center; Professor of Education

GOURD, WARREN A., B.A., Prof. M. Anderson, Ph.D., The Ohio State University; Assistant Professor of Pharmacy

GRAZER, WILLIAM F., Ph.D., University of Arizona; Assistant Professor of Plant Science

GRIFFITH, MARY K. (Mrs.), B.A., University of Montana; Library Associate in Library Service

HAEGER, JAMES R., Ph.D., University of Wisconsin; Associate Professor of Botany

HAINSWORTH, BRAD E., Ph.D., University of Utah; Assistant Professor of Political Science

HALL, CHARLES B., M.A., State University of New York; Instructor in English

HALL, ROBERT F., Ed.D., University of Montana; Coordinator of Extension and Continuing Education; Assistant Professor of Education

HALVORSON, CURTIS H., B.S., University of Wisconsin; Research Associate in Forestry (Faculty Affiliate)

HANABACK, OSCAR J., Ph.D., University of Wisconsin; Professor of History

HAMPION, H. DOANE, Ph.D., University of Colorado; Professor of History

HANNA, WILLIAM T., Jr. (Major), B.S., State University of New York Maritime College; Associate Professor of Military Science (Faculty Affiliate)

HANSEN, BRIE, M.A., University of Washington; Professor Emeritus of Speech

HANSEN, DANIEL L., M.S., Michigan State University; Instructor in Marketing (part-time)

HARD, CHARLES E., M.F., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

HARD, MABELLE G. (Mrs.), M.A., University of Montana; Instructor in Sociology and Social Welfare (part-time)

HARIS, DALE A., B.A., University of Montana; Research Associate in Business Administration (part-time)

HARR, JOHN T., Ph.D., University of Montana; Associate Professor of Wildlife Management

HART, RAY L., Ph.D., Yale University; Chairman and Professor of Religious Studies

HARTON, ALLAN L., M.F., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

HARVEY, LEROY H., Ph.D., University of Michigan; Professor of Botany

HARVEY, MARIA (Mrs.), M.A., University of Michigan; Lecturer in Foreign Languages

HATCHER, KAREN A. (Mrs.), M.S., University of Wisconsin Library Association; Catalog Librarian (Instructor)

HATTON, DONALD C., A.M., University of Oklahoma; Instructor in English

HAUP, JOHN E. (Major), B.S., Gonzaga University; Associate Professor of Military Science (Faculty Affiliate)

HAVER, ROBERT G., B.S., University of Montana; Research Associate in Forestry (Faculty Affiliate)

HAY, JOHN G., M.A., University of Wisconsin; Instructor in Foreign Languages

HAYDEN, RICHARD J., Ph.D., University of Chicago; Professor of Physics and Astronomy

HAYES, LUCIUS D., Ph.D., University of Arizona; Assistant Professor of Political Science

HEILIGER, ALBERT T., Ph.D., Johns Hopkins University; Professor Emeritus of Business Administration (Management)

HELLECK, GEORGE B., Ph.D., University of Michigan; Professor of Economics

HERINGWAY, PETER F., Michigan State University; Associate Professor of Psychology

HENDERSON, DOROTHEA L., M.S., University of Tennessee; Associate Professor of Home Economics

HENDERSON, MARVIN E., Ph.D., Oregon State University; Associate Professor of Mathematics

HENDRICKSON, JOHN H., M.M., University of Oregon; Campus Service Coordinator of the Natural Resources Service (Assistant Professor)

HENDRIKSON, FREDERICK A., M.A., University of Montana, C.P.A., Montana; Professor of Business Administration (Accounting and Finance)

HENRY, WILLIAM S., M.A., University of Montana; Operations Manager of Computer Center; Instructor in Computer Science

HERTIES, CHARLES F., M.A., Columbia University; Professor of Health, Physical Education and Recreation

HERS, PHILIP J., M.A., State University of Iowa; Director of Radio-Television; Associate Professor of Journalism

HERWIG, GUS, Ph.D., University of Washington; Associate Professor of Mathematics

HILL, FRANCES A., Ph.D., Ohio State University; Assistant Professor of Psychology

HILL, WILLIAM E., Ph.D., University of Wisconsin; Assistant Professor of Chemistry

HISTAND, MELVIN, B.S., University of New Mexico; Research Associate in Forestry (Faculty Affiliate)

HISKEL, ROBERT I., Ph.D., University of Colorado; Visiting Professor, Human Education Program (Malmstrom Air Force Base)

HOGUE, LAWRENCE W., M.A.L.S., University of Michigan; Associate Professor of Education

HOFSTADTER, ALAN R., Ph.D., University of Michigan; Assistant Professor of Mathematics

HOFSTADTER, LEONARD C., M.D., University of Washington; Associate Professor of Mathematics

HOGAN, ROBERT H., Ph.D., University of New Mexico; Professor of Art (Sculptural arts, winter and spring 1969-70)

HOJEN, JACOB J., M.D., Assistant Visiting Professor of Surgery

HOLLIS, JOHN R., M.F., University of Washington; Research Associate in Forestry (Faculty Affiliate)

HUFF, THOMAS P., Ph.D., Rice University; Assistant Professor of Psychology

HUGO, RICHARD A., M.A., University of Washington; Associate Professor of English

HUMMEL, J. GROVE, M.A., Columbia University; Professor of Music

Huysgen, Donald W., Ed.D., Colorado State College; Associate Professor of Education

HUT, LUCIUS (LUTZ) M.M., Royal Conservatorium, Rotterdam; Assistant Professor of Music

Hutton, Gordon, B.S., Colorado State University; Assistant Visiting Lecturer in Management (Winter and spring, 1969-70)

HYNDAK, DONALD W., Ph.D., University of California; Associate Professor of Geology

IBING, ROBERT S., Ph.D., University of Texas; Assistant Professor of Mathematics

Ivanov, Vasile F. (Captain), B.S., University of Illinois; Associate Professor of Military Science (Faculty Affiliate)

Jacobs, Richard C., M.A., University of Iowa; Instructor in Art

Jaekson, MARK J., Ph.D., University of California; Chairman and Professor of Physics and Astronomy

Jackson, Richard H., M.A., Hebrew Union College, Cincinnati, Ohio; Acting Chairman and Associate Professor of Drama

Jagad, PHILIP H., M.F., University of Minnesota; Visiting Lecturer in Management, Business Administration (Winter and spring, 1969-70)
JARDA, HORST, Ph.D., University of Vienna; Professor of Foreign Languages

JAY, ROBERT H., Ed.D., University of Oregon; Associate Professor of Education

JENGEL, WILLIAM L., Ph.D., University of Minnesota; Lecturer in Zoology (Faculty Affiliate)

JENK, DONALD A., Ph.D., University of Florida; Associate Professor of Zoology

JENNI, MARY ANNE, M.A., University of Florida; Assistant in Mathematics (Fall and winter, 1989-70)

JENSEN, JOSEPH W., Ph.D., Michigan State University; Assistant Professor of Psychology

JEFFERSON, C. ROLYN, Ph.D., University of California, Professor of Education and Administration (Fall, 1989-70)

JEFFEKES, RANDOLPH H., M.S., University of Illinois; Assistant Professor of Physics and Astronomy

JOHNSON, MAXINE C. (Mrs.), B.A., Russell Sage College; Assistant in Health, Physical Education and Recreation (Winter and spring, 1989-70)

JOHNSON, JAMES F., Ph.D., National Catholic School of Social Service; Instructor in Sociology and Social Welfare (Winter, 1976)

JOHNSON, CHARLES H., B.M., University of Montana; Lecturer in Music (part-time)

JOHNSON, DALE L., M.A., University of Montana; Archivist, Library

JOHNSON, JOHN C., M.S.W., Catholic University of America; Associate Professor of Sociology and Social Welfare

JOHNSON, MAXINE C. (Mrs.), M.A., University of Montana; Assistant Director of the Bureau of Business and Economic Research and Associate Professor of Business Administration

JOHNSON, THOMAS C., Ph.D., University of Chicago; Professor of Management (Business Administration)

JOHNSON, DONALD O., Ph.D., Eastman School of Music, Associate Professor of Music

JOHNSON, EUGENE J. (Captain), B.A., University of Montana; Associate Professor of Military Science (Faculty Affiliate)

JORDAN, EVAR P., Ph.D., University of Iowa; Associate Professor of Speech Pathology and Audiology

JURENILE, ALAN, M.S., West Virginia University; Instructor in Forestry (Fall and Spring, 1969-70)

JUDAY, RICHARD E., Ph.D., Professor of Chemistry

KARLIN, JULIE A., Ph.D., University of Minnesota; Professor of History

KELLER, EDWARD J., B.A., San Jose State College; Lecturer in Chemistry

KEMP, JENNY C., Ph.D., Ohio State University; C.P.A., Montana; Chairmain and Professor of Accounting and Finance (Business Administration)

KETTLEWELL, NEIL M., Ph.D., University of Michigan; Associate Professor of Psychology

KING, WALTER N., Ph.D., Yale University; Professor of English

KIRKPATRICK, THOMAS O., Ph.D., Ohio State University; Associate Professor of Business Administration (Management)

KITTREDGE, WILLIAM A., M.F.A., University of Iowa; Assistant Professor of Foreign Languages

KNIGHT, ARTHUR C., M.D., University of Maryland; Staff Physician, Health Service

KNUTZ, ERICH R., M.S., University of Montana; Instructor-Administrative Assistant in Center for Natural Resources, Forestry

KOEPF, DONALD E., Ph.D., University of Wisconsin; Chairman and Professor of Education and Office Administration (Business Administration)

KONZER, RICHARD L., Ph.D., University of Chicago; Professor of Forestry

KOOTRA, WALTER, Ph.D., University of South Dakota; Assistant Professor of Microbiology

KOTOK, EDWARD S., M.D., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

KRAMER, JOSEPH, Ph.D., University of Nebraska; Professor Emeritus of Botany

KRIS, JOHN P., Ph.D., Yale University; Professor of Forestry

KRISMER, JOHN A. (Major), B.S., University of Santa Clara; Associate Professor of Military Science (Faculty Affiliate)

KRUCKERBERG, ROBERT F., M.S., Yale University; Research Associate in Forestry (Faculty Affiliate)

KUSCH, IRWIN J., Jr., B.S., Northern State College, Aberdeen, South Dakota; Assistant Professor of Education

LACKEY, LAWRENCE B.S., University of Michigan; Professor of Forestry (Faculty Affiliate)

LACKEY, THOMAS W., Ph.D., University of Pennsylvania; Lecturer in Immunology, Department of Microbiology (Faculty Affiliate)

LACKMAN, DAVID B., Ph.D., University of Pennsylvania; Lecturer in Immunology, Department of Microbiology (Faculty Affiliate)

LACHNITWITZ, GERTHON (Mrs.), Ph.D., Goettingen University (Germany), Associate Professor of Foreign Languages

LADY, EDWARD T., M.A., University of Montana; Instructor in English

LANFAR, J., RAY, Ph.D., Rice University; Assistant Professor of Philosophy

LANGE, ROBERT W., M.F., Colorado State University; Associate Professor of Forestry

LANFRECHT, PETE P., Ph.D., University of California; Professor of Foreign Languages

LASSEN, HERBERT RAY, Ph.D., University of Utah; Visiting Professor of Sociology and Social Welfare

LARSON, CARL L., M.D., University of Minnesota; Director of the Stella Duncan Memorial Institute; Professor of Microbiology

LAWRY, EILEEN YOST (Mrs.), Ph.D., Stanford University; Assistant in Mathematics (Winter, 1970)

LAWRY, JOHN F., Ph.D., Harvard University; Associate Professor of Philosophy

LEA, MURIEL JANE (Mrs.), M.Mus., College Conservatory of Music, Cincinnati; Assistant Professor of Music

LEAVITT, C. W., M.D., Harvard University; Dean Emeritus and Professor Emeritus of Law

LEE, ANDREW E., Ph.D., University of New Mexico; Assistant Professor of Psychology

LESTER, JOHN L., B.Mus., Southern University; Professor of Music

LEWIS, GEORGE D., M.Mus., University of Montana; Associate Professor of Music

LEWIS, HARLEY W., M.S., University of Montana; Track and Cross Country Coach and Instructor in Health, Physical Education and Recreation

LEWIS, MARY JEANNE (Mrs.), B.M., University of Montana; Lecturer in Music (part-time)

LEWIS, VANETTA (Mrs.), M.Ed., University of Montana; Associate Professor of Business Administration

LIN, PETER C. H., M.S., University of Wisconsin; Research Associate in Business and Economic Research; Assistant Professor of Business Administration

LINDEMANN, ZONA, M.S., Washington State University; Instructor in Music (Faculty Affiliate)

LINDSEY, ROBERT O., Ph.D., University of Oregon; Associate Professor of Statistics

LINDSEY, RICHARD E., Ph.D., University of Wisconsin; Professor of Chemistry

LITVIN, PAUL J., B.S.F., West Virginia University; Instructor in Forestry (Fall and Spring, 1969-70)

LOFTSBERG, DON C., Ph.D., Montana State University; Assistant Professor of Mathematics

LOHN, SHIRMAN, V., LL.M., Harvard University; Lecturer in Law (part-time)

LOOMISON, EMMA B. (Mrs.), M.A., University of Montana; Assistant Registrar (Instructor)

LORENZ, RAY, M.S., University of Washington; Associate Professor of Health, Physical Education and Recreation

LORD, EMILIE (Mrs.), M.A., University of Montana; Instructor, Public Relations Service; Director of the Bureau of Business and Economic Research and Professor of Business Administration

LORBY, EARL C., Ph.D., Johns Hopkins University; Professor of Chemistry

LOTT, ROY B., Ph.D., University of Wisconsin; Chairman and Professor of Political Science

LOTTICK, KENNETH V., Ed.D., Harvard University; Professor Emeritus of Business Administration

LOWE, WALTER J., Ph.D., Yale University; Associate Professor of Forestry and Zoology

LOWIS, DAVY P., Ph.D., Duke University; Research Associate in Forestry (Faculty Affiliate)

LUCAS, ERIC, Ph.D., Ph.D., University of Wisconsin; Research Associate in Forestry (Faculty Affiliate)

LUCES, ROBERT W., M.S., North Dakota State University; Assistant Professor of Education (part-time)

LURES, WILFORD, J.D., University of Southern California; Assistant Professor of Law

LURES, PHILIP H., Ph.D., University of Michigan; Assistant Professor of Business Administration

LYMAN, NORMAN JAEKEL, M.A., University of Denver; Cataloger-Assistant Professor of School of Law-Library

LYNN, JACOB, Ph.D., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

MACNAB, MANUEL, A., Ph.D., University of California, Santa Barbara; Assistant Professor of Sociology

MACNAB, STEPHEN F., Ph.D., University of California; Assistant Professor of Sociology

MAIDEN, FORREST H., B.S., Montana State University; Research Associate in Computer Science (Faculty Affiliate)

MALLORY, R. PATRICK, M.L.S., University of Illinois; Acquisitions Librarian (Assistant Professor)

MALOUP, ASLIE (Mrs.), B.S., University of Utah; Assistant in Home Economics (part-time)

MALOUP, CARLIN I., Ph.D., Columbia University; Professor of Anthropology

MANAHAN, NANCY K., M.A., Denver University; Assistant Catalog Librarian (Assistant)

MARCH, ROBERT M., M.A., University of Oregon; Associate Professor of Business Administration

MANLOVE, SQUIRES, M.S., San Jose State College; Associate Professor of Forestry (Faculty Affiliate)

MANNING, WILLIAM M., M.Mus., Drake University; Acting Chairman and Associate Professor of Music

MANNFELD, MICHAEL J., M.A., University of Montana; Professor of History (on leave)

MARSH, REED C., D.V.M., Colorado State University; Research Associate in Forestry (Faculty Affiliate)

MARSHALL, THOMAS R., Ph.D., University of Arizona; Assistant Professor of Physics and Astronomy

MARSTON, JOSEPH, B.A., University of Montana; Lecturer in Business Administration (Management) (part-time)

MARTEL, EARL W., B.A., University of Montana; Manager, Field House; Business Manager of Athletics (Instructor)

MARVIN, ROY R. (Mrs.), M.A., University of Montana; Instructor in Foreign Languages

MARTINSON, ALVIN, M., Ph.D., University of Montana; Associate Professor of Business Education and Office Administration (Business Administration)
MARVIN, EDWIN L., M.A., Harvard University; Professor Emeritus of Philosophy
MASON, DAVID R., S.J.D., Harvard University; Dixon Professor Emeritus of Law
MASON, SUSIE D. (MRS.), University of Tennessee; Instructor in Home Economics (part-time)
MATTHAI, CHARLES R., M.E.D., University of Montana; Assistant Professor Emeritus of Education
MCBROOM, WILLIAM H., Ph.D., Ohio State University; Assistant Professor of Sociology
MCCARE, JOHN M., J.D., University of Montana; Assistant Professor and Assistant Dean of Law
MCCLAIN, SARA C. (MRS.), M.A., Indiana University; Instructor in Pathology and Audiology
MCCLINTOCK, MICHAEL W., Ph.D., Cornell University; Assistant Professor of English
MCDOUGAL, JAMES M., Ph.D., Louisiana State University; Assistant Professor of Geography
MCENERY, LANZ C., B.D., Drew Theological Seminary; Research Associate in Forestry
MCDOUGIL, KEITH A., Ph.D., University of Pittsburgh; Chairman and Associate Professor of Foreign Languages
MCKEEN, FRANK C., B.A., University of Montana; Assistant Professor of Mathematics (part-time) (Winter, 1970)
MCGRATH, LANZ C., B.D., Drew Theological Seminary; Research Associate in Forestry
MCFREEMAN, ROSALIE M., B.A., University of Montana; Assistant Professor of English
MCPHERSON, ROBERT C., M.A., Ohio State University; Associate Professor of Journalism
MCGowan, Fred F., M.A., Northwestern University; Instructor in Philosophy
McHugh, Helen H. (Mrs.), M.E.D., University of Montana; Instructor in Pathology and Audiology
MCLEAFET, BERNARD J., M.D., Jefferson Medical College; Lecturer in Pathology and Medical Technology, Department of Microbiology (Fall, 1969)
MCCLUSKEY, EDWARD A., M.A., University of Toledo; Assistant Professor of English
MEANS, JOHN R., Ph.D., University of Colorado; Assistant Professor of Psychology
MEDCOPER, RICHARD M., M.S., University of Rhode Island; Lecturer in Home Economics (Fall, 1969)
MENDOZA, RUSTEM S., Ph.D., University of Rhode Island; Professor of Pharmacy
MEXA, GALE E., Ph.D., University of Washington; Assistant Professor of Chemistry
MELTON, WILLIAM G., Jr., M.S., University of Michigan; Instructor in Zoology
MERRIAM, HAROLD G., Ph.D., Columbia University; Professor Emeritus of English
MERRILL, A. S., Ph.D., University of Chicago; Vice President Emeritus; Dean Emeritus of the Faculty; Professor Emeritus of Mathematics
MERTZ, HARLEY H., B.A., University of Montana; Chairman, Montana Cooperative Wildlife Research Unit; Instructor in Zoology (Faculty Affiliate)
MILLER, CHARLES N., Ph.D., University of Michigan; Assistant Professor of Botany
MILLER, EDWARD C., M.A., University of South Dakota; Assistant Professor of Journalism
MILLER, J., EARL, Ph.D., University of Illinois; Professor Emeritus of Chemistry
MILLER, JACK B., B.S., University of Montana; Assistant in Health, Physical Education and Recreation; Head Golf Coach; Manager of Golf Course and Bowling Alley
MILLER, KURT R., M.D., University of Southern California; Assistant Professor of Music
MILLER, PAUL E., M.A., University of Texas; Assistant Professor, Sociology and Social Welfare
MILICIC, JOSEPH R., M.A., University of Notre Dame; Instructor in English
MILLS, GEORGE H., Ed.D., University of Illinois; Professor of Education
MILLS, DOUGLAS E., M.A., University of California; Director of Technical Services, Library (Associate Professor)
MILNER, KELSEY C., Ph.D., Tulane University; Lecturer in Medical Microbiology (Faculty Affiliate)
MILNARCZYK, FANNIE E. (MRS.), M.S., Washington State University; Associate Professor of Home Economics
MINO, JOHN J., Ph.D., Brown University; Assistant Professor of Economics
MURPHY, GEORGE L., LL.B., University of Montana; Administrative Vice President; Associate Professor of Business Administration
MURPHY, JAMES D., M.D., University of Oklahoma Medical School; Lecturer in Medical Microbiology (Faculty Affiliate)
MOORE, JOHN E., M.A., University of Michigan; Professor of English
MOORE, MARY Y. (MRS.), M.S., Drexel Institute of Technology; Assistant Catalog Librarian (Instructor)
MORRIS, MELVIN S. M.S., Colorado State University; Professor of Forstery
MULLIN, CHRISTOPHER G., M.A., University of Washington; Assistant Catalog Librarian (Instructor)
MUNOZ, JOHN J., Ph.D., University of Washington; Lecturer in Microbiology (Faculty Affiliate)
FACULTY DIRECTORY

PAGE 86

Power, Thomas W., M.A., Princeton University; Lecturer in Economics.

Preche, Sherman J., Ph.D., Washington State University; Chairman and Professor of Botany.

Prescott, Gerald W., Ph.D., University of Iowa; Professor of Botany (part-time) (on leave 2-1-70 to 5-15-70).

Purk, Douglas C., M.A., University of California, Santa Barbara; Instructor in English.

Ramsdell, Berenice B. (Mrs.), Associate Professor Emeritus of Music.

Rogel, William H., M.A., University of Washington; Instructor in Drama.

Ravinsky, Jr., Ed.D., University of Idaho; Assistant Professor of Education.

Ream, Robert R., Ph.D., University of Wisconsin; Assistant Professor of Education.

Reimer, Milton K., Ph.D., University of North Dakota; Assistant Professor of Education.

Reinhart, Howard H., Ph.D., University of Michigan; Chairman and Professor of Mathematics.

Reinholtz, Richard E., M.Ed., University of Minnesota; Associate Professor of Music.

Reynolds, Florence A.M.D., Eastman School of Music; Professor of Music.

Riheiner, Nasey A., University of Montana; Trainer, Athletics; Instructor in Health, Physical Education and Recreation.

Richards, Dennis L., M.A., Florida State University; Documents Librarian (Assistant Professor).

Richman, Luther A., Ed.D., University of Cincinnati; Professor Emeritus of Music.

Ridge, Jonice R., Ph.D., Stanford University; Assistant Professor of Foreign Languages.

Rise, Harlan C., Ed.D., University of Montana; Professor of Education.

Roberts, Dexter M., Ph.D., Stanford University; Assistant Professor of English.

Roberts, Luciana (Mrs.); Assistant in Foreign Languages (part-time).

Rockeau, Louis A., B.A., University of Montana; Assistant Basketball Coach.

Roe, Arthur L., M.S., University of Montana; Lecturer-Research Associate in Forestry (Winter and spring, 1969-70).

Rosenkranz, Edwin, Ed.D., Colorado State College; Assistant Professor of Music.

Rotkaele, Richard C., B.S., University of Washington; Research Associate in Forestry (Faculty Affiliate).

Roya, Perry F., M.B.A., University of Michigan; Professor of Business Administration.

Rusch, Jon A., Ph.D., University of Michigan; Lecturer in Microbiology (Faculty Affiliate).

Runke, J. Franklin, Ph.D., State University of Iowa; Dean and Professor of Education.

Rukoff, Lester R., LL.M., University of Michigan; Professor of Law.

Santorio, June Francis; Assistant in Mathematics and Computer Center.

Sapp, Franklin, B.A., New York University; Professor of Psychology (Assistant Professor).

Schiff, Robert G., M.L.S., University of Oklahoma; Science Librarian (Associate Professor). 

Schmaute, Jack L., M.P., University of Montana; Research Associate in Forestry (Faculty Affiliate).

Schmidt, Wyma C., M.S., University of Montana; Research Associate in Forestry (Faculty Affiliate).

Schulz, Phillip, Ph.D., University of Washington; Assistant Professor of Mathematics.

Schuster, Cynthia A. (Mrs.), Ph.D., University of California at Los Angeles; Assistant Professor of Biology (on leave 1969-70).

Schwane, Walter C., Ph.D., State University of Iowa; Coordinator of Summer Session and Chairman of Professor of Health, Physical Education and Recreation.

Schwartz, James R., B.S., University of Montana; C.P.A., Montana; Instructor in Accounting and Finance (Business Administration).

Schwidensin, Carl J., M.S., Brigham Young University; Visiting Associate Professor Minuteman Education Program (Malmstrom Air Force Base) (January 1-June 30, 1970).

Seljak, Harland, M.E., University of Montana; Assistant Professor of Education.

Shaftizaden, Fred, Ph.D., University of Birmingham; Professor of Chemistry and Forestry and Director of the University of Montana Wood Chemistry Laboratory.

Shallenberger, G. D., Ph.D., University of Chicago; Professor Emeritus of Physics.

Shannon, Richard E., Ph.D., Ohio State University; Professor of Economics.

Shapovaloff, Lusy (Mrs.), Ph.D., University of Washington; Assistant Professor of Foreign Languages.

Shashok, Raymond J., Ph.D., University of Maryland; Associate Professor of Health, Physical Education and Recreation.

Sharack, Floyd W., Ph.D., University of Utah; Chairman and Associate Professor of Anthropology.

Shearman, Raymond C., M.S., Utah State University; Research Associate in Forestry (Faculty Affiliate).

Sheldon, Andrew L., Ph.D., Cornell University; Assistant Professor of Speech Communication.

Shepherd, Wesley N., M.A., Arizona State University; Instructor in Speech Communication.

Sheridan, Richard P., Ph.D., University of Oregon; Assistant Professor of Botany.

Sherman, John W., M.A., Arizona State University; Instructor in Education.

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Silverman, Arnold J., Ph.D., Columbia University; Professor of Geology.

Sletten, Vernon O., Ed.D., University of Oregon; Professor of Education.

Smith, David J., Ph.D., University of Washington; Assistant Professor of English.

Smith, Leo L., M.A., University of Washington; Registrar; Professor of Education.

Smith, Richard K., M.B.A., Harvard University; Associate Professor of Accounting and Finance (Business Administration).

Smith, Robert L., M.A., Syracuse University; Instructor in Foreign Languages.

Smith, Thomas M., S.M., University of Montana; Instructor in Actuarial Science and Finance (Business Administration).

Solberg, Richard A., Ph.D., University of California at Los Angeles; Acting Dean, College of Arts and Sciences; Director of the Biological Station; Professor of Botany.

Sorensen, Thora, Ph.D., Mexico National University; Professor Emeritus of Foreign Languages.

Sowards, Lonis H. (Mrs.), M.S., Montana State University; Instructor in Forestry (Fall and winter, 1969-70).

Spees, Lucile E., M.A., University of Chicago; Documents Librarian Emeritus (Professor Emeritus).

Shivastava, Hari Mohan, Ph.D., University of Lucknow; Visiting Associate Professor of Mathematics.

Stael, Nora, M.A., Spalding University; Professor of Health, Physical Education and Recreation (part-time).

Stanley, George M., Oregon State University; Research Associate in Forestry (Faculty Affiliate).

Steel, Robert M., F., University of Michigan; Associate Professor of Forestry.

Steenland, Sara C. (Mrs.); M.S., Montana State University; Chair­man and Associate Professor of Home Economics.

Sterling, Alice W. (Mrs.); B.S., St. Cloud State College; Research Associate and Adjunct Librarian; Institute for Social Science Research.

Stevens, Frederick A., M.S., Purdue University; Head Swim Coach; Instructor in Health, Physical Education and Recreation.

Swanson, Robert R., Ph.D., University of Arizona; Assistant Professor of Mathematics (on leave 1969-70).

Stewart, John M., Ph.D., University of Illinois; Acting Dean, Graduate School; Professor of Chemistry.

Stickney, Peter F., M.S., University of Wisconsin; Research Associate in Forestry (Faculty Affiliate).

Stocking, John R., M.A., University of British Columbia; Assistant Professor of Art.

Stockstad, Dwight S., M.S., University of Montana; Research Associate in Forestry (Faculty Affiliate).

Strohmer, Herbert G., D.V.M., Iowa State University; Lecturer in Veterinary Medicine, Department of Microbiology (Faculty Affiliate).

Stone, Albert W., LL.B., Duke University; Professor of Law.

Storer, William G., Ed.D., Stanford University; Professor of Education.

Stoody, Abner L., Ed.D., Stanford University; Professor of Health, Physical Education and Recreation (deceased 1-22-70).

Suchy, John F., Ph.D., University of Colorado; Professor Emeritus of Pharmacy.

Sullivan, Robert E., LL.B., University of Notre Dame; Dean and Professor of Law.

Sun, Li-ten, M.S., Oklahoma State University; Research Associate Professor of Forestry (Faculty Affiliate) in Bureau of Business and Economic Research; Instructor in Business Administration.

Swanson, Margaret A. (Mrs.), M.Ed., University of Washington; Associate Professor of Business Administration (Business Education and Office Administration).

Swartout, Jack B., University of Montana; Athletic Director and Head Football Coach.

Swazy, Jack (Colonel), B.A., University of Washington; Chairman and Professor of Aerospace Studies (Faculty Affiliate).

Swearingen, T. G., B.A., University of Montana; Director Emeritus of the College of Business; Professor of Business Administration (Business Administration).

Taggart, Marie M., M.M.E., University of Montana; Librarian in Music (part-time).

Taylor, Harold, Ph.D., University of Illinois; Professor of Social Welfare.

Taylor, Alan R., M.S.F., University of Montana; Research Associate in Forestry (Faculty Affiliate).

Taylor, Dar C., Ph.D., University of Michigan; Professor of Anthropology.

Taylor, John J., Ph.D., Ohio State University; Professor of Microbiology.

Taylor, Norman E., Ph.D., University of Minnesota; Vice President for Research; Director of the Research for the University of Mont­ana Foundation (Business Administration).

Templeton, James R., Ph.D., University of Oregon; Associate Professor of Zoology.

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Thomas, Forrest D., Ph.D., Pennsylvania State University; Associate Professor of Chemistry.

Thompson, Earl C., M.L.S., Emory University; Dean of Library Services (Professor).