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1971-1972 Course Catalog

University of Montana–Missoula. Office of the Registrar

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UNIVERSITY OF MONTANA BULLETIN

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The two calendar days preceding the final week of the quarter is a "no class" or study period.

FALL QUARTER 1971
September 19-20 (Sunday-Monday) Orientation
September 21-22 (Tuesday-Wednesday) Registration
September 23 (Thursday) Instruction Begins
October 11 (Monday) Columbus Day, Holiday
October 25 (Monday) Veterans’ Day, Holiday
November 22-23 (Monday-Friday) Thanksgiving Vacation
December 9-10 (Thursday-Friday) No Class Days
December 11-17 (Saturday-Friday) Final Week of the Quarter
December 17 (Friday) Fall Quarter Ends

WINTER QUARTER 1972
January 3 (Monday) Registration
January 4 (Tuesday) Instruction Begins
February 12 (Saturday) Lincoln’s Birthday, Holiday
February 21 (Monday) Washington’s Birthday, Holiday
March 9-10 (Thursday-Friday) No Class Days
March 11-17 (Saturday-Friday) Final Week of the Quarter
March 17 (Friday) Winter Quarter Ends

SPRING QUARTER 1972
March 27 (Monday) Registration
March 28 (Tuesday) Instruction Begins
May 29 (Monday) Memorial Day, Holiday
June 1-2 (Thursday-Friday) No Class Days
June 3-9 (Saturday-Friday) Final Week of the Quarter
June 9 (Friday) Spring Quarter Ends
June 11 (Sunday) Commencement

SUMMER SESSION 1972
June 19 (Monday) Instruction Begins
July 4 (Monday) Independence Day, Holiday
July 19 (Wednesday) First Half Session Ends
July 20 (Thursday) Second Half Session Begins
August 18 (Friday) Summer Session Ends
about the university...

FOUNDING AND NAME... The University of Montana was chartered February 17, 1893, by the Third Legislative Assembly. Later legislation changed the name to the State University of Montana and Montana State University. On July 1, 1965, 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—Lower 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 is approved by its appropriate national accrediting organization: the American Association of Collegiate Schools of Business, the American Chemical Society, the National Council for Accreditation of Teacher Education, National Association of Schools of Music, Society of American Foresters, American Council on Education for Journalism, 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 twelve-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) graduate professional and advanced professional education based on a sound foundation in the 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 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) provides maximum opportunities for 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.

EQUAL OPPORTUNITY EMPLOYER... The University of Montana is committed to a program of equal opportunity in faculty and staff recruiting, employment and advancement, in student admission, employment and financial assistance regardless of race, color, religion, sex, or national origin.

facilities...

PROPERTY... The main University campus spreads 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 Port Missoula where the University owns a parcel of 395 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 100 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 cabins, and 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 Revised Codes of Montana, 1947, Vol. 3, Section 28-301. 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 waterflow 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 woodlands ... To study and develop the establishment of wildlife shelter and wildlife management 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 land commissioners, the state fish 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, as to collect and administer, on 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, dependent on the need for 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 Fish and Wildlife Service of the U.S. Department of Interior, 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 benefit of the citizens 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.

The Cooperative Wildlife Research Unit allocates funds for about four graduate research fellowships for students working toward a Master of Science in Wildlife Biology, or a Ph.D. in Zoology or in Forestry and Botany. No special form is required to apply for one of these fellowships; simply apply for admission. All students admitted to the graduate program are automatically considered for fellowships.

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

THE COMMUNICATION RESEARCH CENTER has as its primary mission providing professional assistance to organizations and agencies interested in understanding and improving communication within the organization and between the organization and its clients. The Center provides facilities and personnel for research in organizations or in a laboratory setting. Additional services include consultative and training programs in communication for business and community groups.

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.
ties and resources will permit. The University maintains the right to limit the number of nonresident students and to establish scholastic requirements which will insure a nonresident student group with high scholastic aptitude and promise of enrichment of the student life on the campus. Applicants must be in the upper 50 per cent of their high school graduating class to be eligible for consideration for admission. If the high school counselor recommends, 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. 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. To be eligible for consideration for early admission an applicant must present a transcript of his high school record, indicating superior achievement, and a letter from his high school principal recommending early admission. The chairman of the department in which the applicant plans to pursue his degree must also approve the early admission.

TRANSFER REQUIREMENTS . . .

RESIDENT: A legal resident of Montana who wishes 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 have a record which would assure his continuance 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 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 enrichment, 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 submitting 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. No action will be taken on an application until this fee has been received in the Office of Admissions. If an applicant is accepted for admission, another $10 application fee must be submitted when the applicant reapplies.

READMISSION OF FORMER STUDENTS . . . A student previously enrolled at the University of Montana who has been officially enrolled at an accredited institution of higher education must reapply as a transfer applicant and submit official transcripts from each institution attended. Former students are not required to submit the $10 application fee. Former students who have not been enrolled during the two years preceding their return to the University must submit a new Health Examination form.

HOW TO APPLY FOR ADMISSION . . .

FRESHMEN APPLICANTS: 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 Office of Admissions, University of Montana, Missoula, Montana 59801.

TRANSFER APPLICANTS: A transfer applicant may obtain an application for admission by writing to the Office of Admissions, University of Montana, Missoula, Montana 59801.

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. No action will be taken on an application until this fee has been received in the Office of Admissions. If an applicant is accepted for admission, another $10 application fee must be submitted when the applicant reapplies.

READMISSION OF FORMER STUDENTS . . . A student previously enrolled at the University of Montana who has been officially enrolled at an accredited institution of higher education must reapply as a transfer applicant and submit official transcripts from each institution attended. Former students are not required to submit the $10 application fee. Former students who have not been enrolled during the two years preceding their return to the University must submit a new Health Examination form.

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 a 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 Autumn Quarter. Applicants 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 acceptance 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 denial of their application 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.
A maximum of 105 quarter credits earned at a junior or community college may be accepted for transfer. That number will include any and all four-year college credits earned prior to or during the period of junior or community college enrollment. An evaluation of transfer credit accepted by the University will be sent to the student soon after the notification of acceptance.

ADVANCED PLACEMENT . . . Advanced placement may be granted based on achievement in college-level high school courses, provided satisfactory scores on the College Entrance Examination Board Advanced Placement Examinations have been received by the University from the Board. Credit for specific examinations is granted subject to the approval of the academic department at the University of Montana in which the course is offered.

TESTING . . . All new freshmen, and transfer students with less than 45 quarter credits earned, 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 is also offered in February, April, and July. Complete information and registration forms are sent to all high school counselors and principals well in advance of each test date. If information is not available, write to the American College Testing Program, P. O. Box 168, Iowa City, Iowa 52240.

The applicant must complete the examination no later than December in order to be eligible for financial aid for the following year.

SPECIAL NOTE: The results of the American College Test must be submitted directly by the American College Testing Program. Results listed on the high school transcript will not be accepted. As an alternative to the College Entrance Test may NOT be substituted for the American College Test. Examination results are used for general advising purposes, to assist in identifying students with high college potential who may be seeking financial aid, and for placement in English and as a part of the information used to determine nonresident student admission.

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
Box 899
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 Office 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 will be 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 fees charged are paid and registration cards are returned 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) receiving direction for registering 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 classmates, 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.

WITHDRAWAL OF COURSES . . . 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.

Dropping courses with a grade of "W," or changing from credit to listener or vice versa, is permitted only during the first six weeks of instruction. To drop or add courses, to change 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.

Dropping courses after six weeks with a "W" or a change from credit to listener status will be granted upon petition to the Graduation Committee only in exceptional cases and upon the signed approval of the student's adviser. An "IP" will be assigned for a course dropped after the sixth week, unless a petition has been approved.

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. After the ninth week, the student who withdraws receives a grade: an incomplete, an "IP" 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's, master's, juris doctor, 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 completion of a major (a concentration in a single discipline or stated interdisciplinary program) of not more than 70 quarter credits.

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.

Details regarding 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
- Economics
- Economics-Political Science
- Economics-Sociology
- English
- French
- Geography
- Geology
- German
- Health and Physical Education
- Education
- History
- History-Political Science
- Home Economics
- Bachelor of Science, with majors in Chemistry, Computer Science, Economics, Health and Physical Education, Recreation and Home Economics
- Bachelor of Science in 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, School of Fine Arts, with majors in Art, Drama or Music
- Bachelor of Fine Arts with major in Art or Drama
- Bachelor of Music, School of Fine Arts, with majors in Performance and Theory or Composition
- Bachelor of Music Education, 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 Resource Conservation
- Bachelor of Arts in Journalism
- Bachelor of Science in Pharmacy
- Bachelor of Arts in Radio-Television

ADVANCED PROFESSIONAL DEGREES

Juris Doctor

academic policies . . .

MAJOR FIELD OF STUDY . . . 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 601 and Math 601. 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 . . . Students will be placed on academic suspension at the end of any academic year, for failure to meet cumulative grade-point average requirements shown in the table below, on all work attempted at the University of Montana. No student will be considered for academic suspension who has completed less than two quarters of work at this University.

<table>
<thead>
<tr>
<th>Number of Credits Attempted</th>
<th>Minimum Cumulative GPA Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-44</td>
<td>1.6</td>
</tr>
<tr>
<td>45-89</td>
<td>1.75</td>
</tr>
<tr>
<td>90-134</td>
<td>1.9</td>
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<tr>
<td>135 or more</td>
<td>2.0</td>
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</tbody>
</table>

After the first suspension, a student is eligible for readmission following the lapse of one academic year, upon application to the Registrar.

Readmission after the first suspension, but prior to the lapse of one academic year, may be granted only by the Dean of the college or school to be entered. A student so readmitted must achieve and maintain a grade average of 2.00 or better each quarter until he has reached the minimum standards required, based upon his cumulative number of hours attempted. Failure to meet these standards will subject the student to a second suspension.

Readmission after more than one suspension may be granted only by the Dean of the college or school to be entered.

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 minors.

REPETITION OF A COURSE . . . When a course is repeated, only the last grade received (excluding “Incomplete”) will be used in calculating the grade-point average.

INDEPENDENT WORK . . . Under the “University omnibus option,” credit is allowed for independent work in topics or problems that are proposed by the student and approved both by the instructor or instructors under whose supervision the work is to be done and by the chairman or chairmen of the Department(s) involved. Such independent work may be registered for at any time and require as many weeks as the instructor(s) shall stipulate. The work may be either off-campus, as the nature of the study requires, although prior approval of all arrangements and faculty supervision must be assured.

All fees must be paid in advance of beginning independent work. The student may not receive a larger number of credit hours than he is registered for, although a smaller number may be completed and credit obtained with the approval of the instructor or instructors. No more than fifteen (15) credit hours may be received in a single topic or problem. A maximum of forty (40) credit hours of independent work is permitted under the University omnibus option.

For each course taken under the University omnibus option, the student's transcript will show the departmental prefix, the level of the course, the number of credit hours, and an exact description of the topic (example: Art/Jr./3: Navajo Pottery, 1870-1890). Petition forms for independent work under this option are available in the Registrar's office.

CREDIT BY EXAMINATION . . . Under certain circumstances, a student may receive credit by examination for a course in which he has not been regularly enrolled. This policy does not apply to law courses. Each school or department may determine those courses, if any, for which credit may be earned by examination. The dean of the school or chairman of the department must approve any arrangement prior to testing for such credit. The student must have a minimum cumulative grade average of 2.00, and an entering freshman must present a high school scholastic record equivalent to a 2.00 grade average in order to earn credit by examination in any course. A student who has completed equivalent material in high school (such as first-year foreign language) may not receive additional credit by examination. A maximum of 30 credit hours may be earned by examination, and not more than 20 credit hours may be earned in any one department.

COLLEGE LEVEL EXAMINATION PROGRAM SUBJECT EXAMINATIONS . . . Credit may be achieved in college level subjects, provided satisfactory scores on the College Entrance Examination Board College Level Examination Board Subject Examinations have been received by the University from the Board. No credit will be allowed for the General Examinations. Credit for specific subject examinations will be granted subject to the approval of the academic department at the University of Montana in which the course is offered.

CREDIT FOR EDUCATIONAL EXPERIENCES IN THE ARMED SERVICES . . . The University may grant elective credit for courses completed in military service schools and training programs, provided such credit is recommended by the American Council on Education in A Guide to Evaluation of Educational Experiences in the Armed Services, and only when the course work is appropriate to the programs of this University.
GRADES . . . The class work of the student will be rated as follows: A—work of the best grade; B—work better than average; C—average work; D—work below average, but barely passing; F—failure; X—not pass (no credit allowed, not counted in grade-point average); P—pass without distinction; F (or P)—satisfactory completion; F (or P)—incomplete (given if some of the work is not completed for good reason. An incomplete will remain on a student's record unless removed); N—work on the course may be continued at a subsequent session. If the 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 to the student; P must appear on the official program request card; (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 residence credit or preparation they may enroll in certain courses 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 or to courses excluded by the instructor or 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 basis. Credit on the course 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 recorded on the student's permanent record. Elevation of the Pass/Not Pass option must be indicated at registration time on the official program request card. After registration, but prior to the end of the sixth week of instruction, an undergraduate student may, upon request to the Registrar, change a Pass/Not Pass enrollment to an enrollment under the A-F grade system, but he may not do so if he interrupts his attendance 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 be graduated 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 shown in the following paragraphs. Students who are candidates for degrees or certificates must file formal applications with the registrar on the date specified in 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 two or three hours laboratory session. A total of 195 credits is required for graduation with a bachelor's degree, except that a greater number is required in art (B.F.A.) and pharmacy. Candidates for the degree of Juris Doctor must complete three years of law before being eligible for a diploma. 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 Bachelor of Science in Pharmacy degree must complete a five-year course. Candidates for the bachelor of arts degree in the College of Arts and Sciences must complete 93 credits in that college, except that credits earned in art and drama may be included in that number. The professional degree of 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 and social welfare, the number of credits is from 40 to 70. This rule on maximum credits allowed does not apply in the Schools of Business Administration, Fine Arts, 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 may be counted toward graduation. Credit in denominational religion courses is not accepted.

Except in the Department of Music, 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 a teaching major or minor in business administration are allowed to present more than 10 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.

QUALITY OF WORK . . . A minimum grade-point average of "C" or 2.00 in all course work attempted, and in all work attempted in the major field, is required for graduation at the University of Montana.

REQUIREMENTS OF PARTICULAR CURRICULA . . . Candidates for a bachelor's degree must comply with any and all requirements announced under a particular curriculum, in addition to meeting the general requirements listed here under requirements for graduation.
RESIDENCE REQUIREMENTS . . . Students who transfer credits earned elsewhere and who seek a degree from the University must, in addition to meeting other requirements, earn not less than 45 credits and fulfill not less than three quarters in resident study at the University; and 35 of the last 45 credits earned for a degree must be earned in resident study at the University. Extension credits earned on campus count toward residence requirements for undergraduate degrees, but correspondence credits do not.

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 last quarter of 3.1 or higher 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 3.5 or higher and, in addition make an honor 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 1972 summer session will open June 19 and close August 18; the first half-session, June 19 to July 19; the second half-session, July 20 to August 18.

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 are 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 fields.

Courses required for Montana secondary and elementary teachers certificates are offered. Graduate work includes 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 Director of Summer Session.

the graduate school . . .

For information on graduate degrees and programs 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 Bulletin, and application forms for admission to graduate work may be secured by writing to the appropriate dean of the school or department chairman.

financial obligations . . .

PAYMENT OF FEES . . . All fees and room and board charges are due and payable in full on or before the date of registration. Students whose financial circumstances require payment of part of the charges due on a deferred basis should contact the Office of Financial Aids no less than two weeks prior to the payment of part of the charges. The Financial Aids Office will evaluate each case in relation to the availability of University funds. In no case is it possible to complete registration without paying the whole or a significant portion of the total charges due at each registration.

*STUDENT FEES*

Full-time Students (those registered for seven or more credit hours)—

The following are the fees payable each academic quarter by full-time students who qualify as residents of the State of Montana:

- **Montana Residents**
  - Registration fee $15.00
  - Incidental fee 75.00
  - Buildings fee 20.00
  - Student Union fee 10.00
  - University Center Operations fee 8.00
  - Student Activities fee (Optional to graduate students) 15.00
  - Health Service fee 13.00
  - Total Montana resident $157.00

For non-resident of Montana, add—

- Non-resident fee $260.00
- Buildings fee 22.50
- Total non-resident $439.50

Limited Registrants—

A student registered for 6 or less credit hours is a limited registrant. Fees per quarter vary in relation to the number of credit hours as follows:

- **Montana resident**
  - One credit hour 21.00
  - Two credit hours 42.00
  - Three credit hours 63.00
  - Four, five or six credit hours 85.00
  - Activities fee (optional) 15.00

Limited registrants who are non-residents of Montana are charged per quarter, in addition to the above, a non-resident fee of $130.00 and a non-resident buildings fee of $11.25.

*The Board of Regents reserves the right to adjust any and all fees at any time.*
RESIDENCE HALL FEES—
Rent for a double room in a University Residence Hall is $104.00 per academic quarter. A limited number of single rooms are available at $149.00 per quarter. Room fees are the same for either residents or non-residents of Montana. Married Student Housing fees are reflected in a separately published brochure.

UNIVERSITY FOOD SERVICE FEE—
All students residing in University Residence Halls are required to utilize the University Food Service program.

Fees for University Food Service are as follows—
- Autumn Quarter (more days in residence) $232.00
- Winter Quarter 205.00
- Spring Quarter 205.00

This fee is the same for either residents or non-residents of Montana.

SUMMARY OF FEES, ROOM AND BOARD—
For Montana residents registered for seven or more credit hours.

<table>
<thead>
<tr>
<th></th>
<th>Autumn Quarter</th>
<th>Winter Quarter</th>
<th>Spring Quarter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fees</td>
<td>$157.00</td>
<td>$157.00</td>
<td>$157.00</td>
<td>$471.00</td>
</tr>
<tr>
<td>Room (double)</td>
<td>104.00</td>
<td>104.00</td>
<td>104.00</td>
<td>312.00</td>
</tr>
<tr>
<td>Board</td>
<td>232.00</td>
<td>205.00</td>
<td>205.00</td>
<td>642.00</td>
</tr>
<tr>
<td>Total, Montana resident</td>
<td>$439.00</td>
<td>$466.00</td>
<td>$466.00</td>
<td>$1,425.00</td>
</tr>
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</table>

For non-resident of Montana, add—

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>Total, non-resident of Montana</td>
<td>$775.50</td>
<td>$748.50</td>
<td>$748.50</td>
<td>$2,272.50</td>
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</tbody>
</table>

Fees for auditing courses, as opposed to enrolling for academic credit, are the same as reflected above.

LAW SCHOOL FEES—
The School of Law is conducted on a semester basis. Semester fees are as follows:

Montana resident—

<table>
<thead>
<tr>
<th></th>
<th>Full-time</th>
<th>Limited</th>
<th>Student Registrant</th>
</tr>
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<tr>
<td>Registration fee</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Buildings fee</td>
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<tr>
<td>University Center</td>
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<td>Operation fee</td>
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<tr>
<td>Total, Montana resident</td>
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<td>$127.50</td>
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Non-resident of Montana, add—

<table>
<thead>
<tr>
<th></th>
<th>Non-resident fee</th>
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<tbody>
<tr>
<td>Non-resident buildings fee</td>
<td>$33.75</td>
<td>$195.00</td>
<td>16.88</td>
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<tr>
<td>Total, non-resident</td>
<td>$636.75</td>
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REFUND SCHEDULE FOR WITHDRAWAL FROM THE UNIVERSITY OR FROM RESIDENCE HALL OCCUPANCY

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</tr>
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<td>Buildings fee</td>
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</tr>
<tr>
<td>U.C. Operations fee</td>
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<td>None</td>
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<td>Student Activities fee</td>
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<td>None</td>
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</tr>
<tr>
<td>Health Service fee</td>
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</tr>
<tr>
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</tr>
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<td>pro-rata</td>
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</table>

PORTION REFUNDED FOR DROPPING FROM FULL TO LIMITED REGISTRANT

<table>
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<th></th>
<th>1st week of</th>
<th>2nd week of</th>
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</tr>
<tr>
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<tr>
<td>U.C. Operations fee</td>
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<tr>
<td>Health Service fee</td>
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</tr>
<tr>
<td>Non-resident</td>
<td>100%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
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</tr>
<tr>
<td>Special purpose fees</td>
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<td>0%</td>
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<tr>
<td>Room or Board</td>
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<td>pro-rata</td>
<td>pro-rata</td>
<td>pro-rata</td>
<td>pro-rata</td>
</tr>
</tbody>
</table>

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 date used in calculating fee cancellations is the official withdrawal date, as recorded by the Registrar of the University.

SUMMER SESSION FEES . . . Fees and Room and Board costs are contained in a separately published Summer Session brochure.

EXTENSION DIVISION FEES . . . Fees for registration in the Extension Division are contained in a separately published Extension Bulletin.

RESIDENCE STATUS . . . Residence status for tuition and fee purposes is determined at the time a student first applies to the University, in accordance with the provisions of the Revised Codes of Montana, 1947, as amended. Once determined, the status assigned does not change in the absence of written evidence to substantiate the claim for change.

In general:

(1) A resident student is a person, legally qualified to determine his own domicile, who has been domiciled in Montana for one year immediately preceding registration at any unit of the Montana University System. Attendance as a full-time student at any college, university, or other institution of higher education within the state shall not alone be sufficient to qualify for residence in Montana.

(2) The residence of a minor is that of his father; or of his mother if there is no father; or of his guardian when the court appointing the guardian certifies that the primary purpose of the appointment is not to qualify a minor as a resident of this state; or of the parent who has custody of the minor.

(3) The residence of a married woman is that of her husband, except that a resident woman student who marries a nonresident does not by that fact alone lose her resident status.

The governing statutes define a number of conditions which may qualify or make exceptions to the above general statements of qualification.

A student having questions about his status, or desiring to petition for a change in his status, may obtain a copy of the appropriate statutes and petition forms by contacting the Registrar's Office (current and former students), or the Office of Admissions (new applicants).

SPECIAL PURPOSE FEES

Late Registration . . . A student who does not complete his registration, including the payment of fees, during the scheduled registration period is assessed a late registration fee of $10 for the first late day, plus $2 for each additional late day thereafter to a maximum of $24.

Dishonored Checks . . . A charge of $2.50 will be assessed each time a personal check is dishonored by the bank upon which it is drawn. This assessment will be charged to the student's account, and he or she will be so notified. A dishonored check at the time of registration may result in the assessment of a late registration fee.

Field Trips . . . Certain departments require field trips, the cost of which is prorated among the students participating in the course. Information concerning field trip costs may be obtained from the academic departments.

Forestry and Music Fees . . . Special purpose fees applicable to forestry and music students are listed under the departmental headings in this bulletin.

Vehicle Registration Fee . . . A vehicle registration fee of $9 for the academic year entitles the owner of a private vehicle
to use campus parking facilities. The fee is payable in full on or before registration for the fall quarter. In the event of withdrawal, $3 is refunded for each full unused quarter. Detailed vehicle regulations are published separately.

**Remedial English and Remedial Mathematics**... A special fee of $36 is charged for enrollment in either remedial English or remedial mathematics, in addition to the regular student fees listed above. The refund schedule applicable to this fee is available at the Office of the University Treasurer.

**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 fee of $25 per quarter is charged graduate students, both resident and non-resident, who are not enrolled in courses but whose activities involve the use of University resources.

**WAR SERVICE EXEMPTIONS**... Registration and incidental fees are waived for honorably discharged persons who served with the 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 qualify for federal veterans benefits. 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 12 credit hours is required for full payment.

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

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**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 are student government, societies and clubs of students engaged in particular studies, professional and honorary organizations, athletic clubs or teams for men or women, student publications, musical organizations, church groups and residence hall clubs.

**OFFICIAL REGISTRATION OF STUDENT ORGANIZATIONS**... Every student organization is required to register with the Dean of Students Office. Until such registration has been processed, an organization is not entitled to the use of space in campus buildings or the use of the name of the University.

The University of Montana is dedicated to the principle that its students have the right to choose members for their various groups without regard to race, creed, color or national origin, even though such selections may be in variance with the policies of national organizations with which the groups may be affiliated. The University, therefore, will stand firmly behind any group whose right to adhere to this principle is questioned.

**OBLIGATIONS OF STUDENT ORGANIZATIONS**...

The State Board of Education has made the following rule: "No contract shall be entered into and no financial obligations assumed by any student organization without the approval of the President or some member of the faculty designated by him."

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**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 prescribed University policy and 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 student maximum performance academically and the use of remedial procedure where indicated; 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 freshman 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, preventive medicine and medical treatment of acute diseases.

The services provided are comprehensive and include medical attention 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 a 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 by a licensed physician of the student's own choice 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 surgery are not covered. Accidents and illnesses arising from accidents or injury 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 ten days hospitalization per year and $200 may be applied to extras (medicine, X-ray and laboratory work).

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 $2.50 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 and dental protection by paying $12.00 per quarter for the autumn, winter and spring quarters and for the summer session. Details of the plan are available from Montana Blue Cross, Savings Center Building, Missoula, 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 scheduling, 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.

STUDENT HOUSING includes eight Residence Halls, two housing areas for married students, and eight fraternity and six sorority houses.

GENERAL CONDITIONS FOR RESIDENCE . . .
A. The student agrees to pay the University as outlined in the Residence Hall Flyer distributed by the Residence Halls Office.

B. The student agrees to familiarize himself with all regulations which the University and the Residence Halls have enacted or may enact, and these rules and regulations are the condition of residence in the hall. All information contained in the Residence Halls Book is applicable.

C. The student is expected to vacate and remove personal belongings from his room immediately upon withdrawal from the University.

MEN’S RESIDENCE REQUIREMENTS. All male unmarried freshman and transfer students having less than 45 credits are required to live in Residence Halls their freshman year. Exceptions are granted to freshmen who are 21 years of age upon entering college or whose parents reside in Missoula. Accommodations in University Residence Halls will be provided for all freshman men and upperclassmen in order of application. Upperclass men who move into Residence Halls will be permitted to contract for board and room quarterly.

WOMEN’S RESIDENCE REQUIREMENTS. All unmarried freshman and sophomore women students under the age of 21 who are not living in their own homes are required to live in the Residence Halls. Junior women (90 credits or 6 quarters in residence) and senior women may reside off campus. If these women move into Residence Halls they will be permitted to contract for board and room quarterly.

RESIDENCE HALLS AND FOOD SERVICE. Application forms and detailed information may be obtained by writing the Admissions Office, University of Montana. A parent’s consent for board and room (for fall quarter only), as announced in the Residence Halls bulletin, must accompany each room application. If a room reservation is cancelled, notice in writing must be received by the Director of Residence Halls on or before September 15 for fall quarter, December 31 for winter quarter and March 20 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.

Residence Halls charges must be paid in advance at the beginning of the quarter or in installments as arranged with the Financial Aids Office.

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

Social life in the halls is encouraged through Residence Halls clubs and numerous activities. Upperclass counselors assist students in making living in the halls enjoyable and beneficial. A social fee of $2 per quarter is assessed the residents in each hall.

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 allowed to suffer unduly 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 main campus. Studio apartments are available, as well as one, two, three and four bedroom apartments.

FRATERNITY AND SORORITY HOUSES . . . Eight national 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 school and extra curricular accomplishments 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 students.

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 Opportunity Grants, Guaranteed Loan Program, Fee Waivers, Law Enforcement Educational Program, National Defense Student Loan; (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 AIDS 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 categories:

1. Dishonesty, such as cheating, plagiarism, or knowingly furnishing false information to the University.

2. Forgery, alteration, or misuse of University documents, records or identification.

3. Obstruction or disruption of teaching, research, administration, disciplinary procedures, or other University activities or of other authorized activities on University premises. Such obstruction or disruption, whether involving individual or group conduct, and whether taking the form of force, trespass, seizure, occupation or obstruction of build­ings, 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 accomplish­ment 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 endangers 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 University facilities.

7. Violation of University policies, rules or regulations concerning student organizations, the use of University facili­ties, or the time, place and manner of meetings or demonstra­tions 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 forbid­den. 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, In­dian hemp, peyote, methaqualone, mescaline, 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-term imprisonment. 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 stu­dents 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 re­affirms 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 demon­stra­tion which does not interfere with the normal operation of the University." Demonstrations within University facilities which otherwise go beyond constitutionally-protected rights and is a violation of any law, ordinance, or University rule, regula­tion or policy, will not be permitted. Students will be charged with misconduct for any individual misconduct com­mitted by them in the cause of a demonstration.

13. Unpaid bills: individual students who owe bills to the University for fees, fines, board and room in the resi­dence halls and other charges are not permitted to register for the succeeding quarter, secure transcript of record or obtain diplomas until 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 Student Blue Cross policy (if taken) limits liability to $1,000, all students who drive cars should be adequately covered by insurance (liability, property damage, medical payments, etc.)

15. Student marriages: the Montana Statutes on mar­riage 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 intent of the Montana law and, furthermore, must report their marriages to the Dean of Students Office immediately.

STUDENT CONDUCT RULES OF PROCEDURE OF UNIVERSITY OF MONTANA

1. The following procedures shall govern all cases in which the University institutes disciplinary proceedings against students for misconduct, except academic offenses which shall include but not be limited to cheating, plagiarism and grade disputes.

2. Definitions.

   a) "Dean's Office" means the Dean of Students or a per­son authorized to act for him.

   b) "Disciplinary action" may include any or all of the following:

      (1) Warning: An official written reprimand.

      (2) Disciplinary Probation: A probationary student status imposed for a specified period of time, during which time, the student may be denied the right to participate as a representative of the Uni­versity in any University sponsored or approved extracurricular activity; the right to operate an automobile on campus; the right to hold office in any University organization (denial of the right to hold office shall include removal from any office then held in any University organization); or any combination of the above.

      (3) Suspension: A termination of student status for a definite or indefinite period of time. During the period of suspension the fact of suspension will be affixed to the student’s transcript.

      (4) Restitution: Money payment to compensate for damaged or destroyed property; repair or replace­ment of damaged or destroyed property; renova­tion of disturbed, cluttered or contaminated areas.
(5) Parental notification: A notice to the student's parents of his probationary or suspended status. (Parental notification may be used only in the case of unmarried minors.)

3. Student Court—creation, composition, selection, and tenure. There is hereby created a Student Court. The members of the Student Court shall be selected in the following manner: Two undergraduate students appointed by ASUM; one graduate student appointed by the President of the University from a list of five graduate students submitted by ASUM; one faculty member appointed by the Budget and Policy Committee of the Faculty Senate; and one faculty member appointed by the President of the University. A Chairman shall be selected by the Student Court from among its members. The Chairman so selected shall serve for one year. Faculty members shall be appointed for two years except the faculty member first appointed by the President shall serve for one year. No members shall serve more than two consecutive terms.

   a) Disciplinary proceedings shall be instituted by the Dean's Office by sending by registered mail to the student his last reported address or personally delivering a notice of charges to the student against whom disciplinary proceedings are initiated. The notice shall inform the student of the rule or regulation charged to have been violated and of the reported circumstances of the alleged violation.
   b) The notice of charges shall request the student to appear in the Dean's Office and shall specify the time and place for the appearance and shall inform the student that he may bring a parent, guardian or counsel to the appearance before the Dean. The time specified shall be not less than 5 days nor more than 10 days following the mailing date or delivery of the notice. Any student may request an earlier appearance which may be granted or denied in the discretion of the Dean.
   c) The notice of charges shall further advise the student that he may elect to have the case transferred directly to the Student Court by notifying the Dean's Office of such election on or before the time specified for his appearance in the Dean's Office.

5. Failure to Respond.
   After receiving notice of charges, if the student fails or refuses to appear in the Dean's Office, and if he has not requested to have the case transferred to the Student Court, the Dean's Office may dismiss the charges, impose any disciplinary action specified by this code in Section 2(b) or transfer the case to the Student Court. The Dean's Office shall notify the student of the action taken. Such action shall not be subject to appeal. To avoid unfairness, the Dean's Office may extend, or reschedule the time to enable the student to respond to the charges.

6. Response to Charges.
   a) If the student appears in response to the notice of charges, the Dean's Office shall advise him of the facts concerning the alleged charges and the names and addresses of witnesses then known to the Dean's Office. The student shall also be advised that he is not required to make any response, that any statement made by him may be used against him, that if he remains silent, his silence will not be taken as an admission against him, and that he may advise the Dean's Office of any witnesses or evidence supporting his position. A parent, guardian, or counsel of the student may be present during the discussion between the Dean's Office and the student.
   b) After the discussion with the student and such further investigation as the Dean's Office deems necessary, the Dean's Office shall proceed as follows:
      1. If the Dean's Office determines that the violation alleged is not supported by the evidence, the charges shall be dismissed and the student notified.
      2. If the Dean's Office determines that the violation occurred as alleged, it may impose any disciplinary action specified by this code in Section 2(b). The Dean's Office shall notify the student of its determination, including the disciplinary action to be imposed. The student may appeal the determination made by the Dean's Office by requesting a hearing before the Student Court. The request shall be received by the Dean's Office no later than the 10th day following the date on which the notice of determination and disciplinary action was received by the student as determined by the date on the registration receipt, if mailed, or the date delivered to the student, if personally delivered. If no written request is received on or before the 10th day after the date of delivery, the disciplinary action imposed by the Dean's Office shall become effective and such action shall be final and not subject to further hearing or appeal. If the student makes a timely request for appeal, the Dean's Office shall transfer the case for hearing.

7. Student Court Hearing.
   a) Original hearings, appeals from the Dean's Office and appeals from a living unit court shall be identical de novo hearings.
   b) Whenever a case is transferred for hearing, the Dean's Office shall notify the Student Court of the transfer and transmit a written statement of the notice of charges. The Chairman of the Court shall promptly give notice to the student of the time, date, and place of the hearing, which shall be held not less than five days and, whenever practicable, not more than ten days after the date of such notice.
   The notice shall advise the student that if he intends to be represented by counsel he must file a statement of such intention with the Dean's Office at least 72 hours before the time scheduled for the hearing. The notice shall also advise the student that the University may be represented by legal counsel.
   The notice shall advise the student that the hearing will be closed to the public unless he files with the Dean's Office a written, signed request at least 72 hours before the hearing requesting the hearing be open to the public.
   c) Conduct of hearing. The student is entitled to be present at the hearing and to be accompanied by advisors of his choice, including legal counsel. The University shall be represented by the Dean's Office, or by counsel appointed by the Dean's Office. The University, through its authorized representative, shall state the case against the student and may present evidence and witnesses in support thereof. The student shall have the right to present witnesses, and to present witnesses and evidence in his behalf. At the hearing, the burden of proving the student guilty of the alleged violation shall be on the University. The hearing shall be closed to the public unless the student requests that the hearing be open to the public. Such request shall be made in writing, signed and delivered to the Dean's Office no later than 72 hours before the time scheduled for the hearing.
   An official verbatim record shall be made by means of tape recording or stenographic report. The Dean's Office shall keep the official record or a transcription thereof for at least one year from the date of final disposition of the case. Upon request by the student the official record shall be transcribed and a copy furnished to him. If the student requests a copy of the official record, he shall pay the cost of transcription.
   The Student Court may prescribe additional rules covering the conduct of hearings not inconsistent with this code.

Within five days after the conclusion of the hearing, the Court shall render its decision. The decision shall be based solely on matters introduced at the hearing. The decision may be a majority vote and the Chairman shall have a vote in all cases. The decision shall contain a finding as to guilt or innocence and a brief statement of the reasons for the decision. Upon
a finding of guilt the Court may impose any disciplinary action specified by this code in Section 2(b). Copies of the Court's findings, decision and the disciplinary action imposed, if any, shall be furnished promptly to the student, the President of the University, and the Dean's Office.

8. Failure to Appear:
A student who fails or refuses to appear at a hearing before the Student Court at the time and place scheduled shall be considered to have waived his right to be heard by the Student Court. However, the Student Court is authorized to hear the evidence from those present, to review the charges, and to make such investigation as it may deem necessary. In such cases of failure or refusal to appear, the Student Court is further authorized to decide the guilt or innocence of the student and upon a finding of guilt to impose any disciplinary action specified by this code in Section 2(b). Such decision shall not be subject to appeal. However, for good cause, the Student Court may extend the time and reschedule the hearing to enable the student to respond to the charges.

9. Living Unit Courts:
   a) Each living unit may establish a court.
   b) The members of the living unit court shall be selected according to procedures established by the living unit's constitution or by-laws.
   c) Living unit courts shall have authority to hear and decide all cases involving charges of student violation of living unit regulations. Cases may be referred to the living unit by the living unit administrative office or by the Dean of Students.
   d) If a violation of a living unit regulation is also a violation of a University regulation, the living unit court may refer the case to the Dean of Students to be handled in accordance with the procedures described in this code.
   e) Upon a finding of guilt, the living unit court may issue a written reprimand; may deny the student specified privileges within the living unit; may order termination of the student's University housing contract and require him to move out of the living unit within 30 days; or order restitution as defined in Section 2(b)(4) of this code.

   The above sanctions may be imposed by the administrative officer in charge of the living unit if the student elects to have his case handled by the living unit administrative officer.

   f) Any decision of the living unit court or the administrative officer of a living unit resulting in the denial of privileges, termination of the student's University housing contract, or an order of restitution may be appealed to the University Student Court by a written, signed request for a hearing in accordance with the procedure provided in Section 6(b)(2) of this code.

ABSENCE FROM CLASS . . .
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. This card must be presented to the administrative officer in charge of the living unit if the student elects to have his case handled by the living unit administrative officer.

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 arrangements for 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.

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.

COLLEGE OF ARTS AND SCIENCES
Anthropology
Biology
Black Studies
Botany
Chemistry
Computer Science
Economics
English
Foreign Languages
Classics
Greek (no major)
Latin
French
German
Italian
Portuguese (no major)
Russian
Spanish
Geography
Geology
Health, Physical Education and Recreation
History
Humanities
Home Economics
Indian Studies
Liberal Arts
Mathematics
Medical Technology
Microbiology
Philosophy
Physical Therapy
Physics and Astronomy
Political Science
Pre-Medical Sciences
Psychology
Religious Studies
Reserve Officers Training
Corps (No majors)
Aerospace Studies
Military Science
Sociology and Social Welfare
Speech Communication
Speech Pathology and Audiology
Wildlife Biology
Zoology

GRADUATE SCHOOL
SCHOOL OF BUSINESS ADMINISTRATION
Accounting
Business Education
Finance
General Business
Management
Marketing
Office Management

SCHOOL OF EDUCATION
Administration and Supervision
Elementary Education
Guidance and Counseling
Library Service
Secondary Education

THE SCHOOL OF FINE ARTS
Art
Drama
Music
Music Education
Elementary Teacher Training
Secondary Teacher Training
Music History and Literature
Music (continued)
Performance
Organ
Piano
String Instruments
Voice
Wind Instruments
Theory or Composition

SCHOOL OF FORESTRY
Forest Science
Forest Business
Forest Resources Management
Watershed
Timber
Wildlife
Range
Forest Recreation
Park Management
Products and Utilization
Natural Resource Conservation

SCHOOL OF JOURNALISM
Advertising
Magazines
News-Editorial
Radio-Television

SCHOOL OF LAW

SCHOOL OF PHARMACY
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 literate 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 the BA degree as entered in the catalog, 20 credits in anthropology courses or approved cognate courses listed below are required for the Bachelor of Arts degree. Credits taken in anthropology must include the following courses: Anth 119, 152, 205, 230, 231, 232, 233, 250, 251, 353, 354, 355, 356, and 357. In addition, one course in ethnology and one course in archaeology must be taken. Not more than 25 total credits in the following variable credit courses may be counted toward the degree: Anth 353, 451, 250, and 251. The following sociology courses must be completed: Soc 101 and 205. Cognate courses that may be used to satisfy the anthropology hours requirement are English 360, Geography 355, and General 230, 231, 232 and 233. A minimum of 35 of the required 50 credits must be in anthropology courses. English 100 must be completed. The foreign language requirement may be met in any of the following ways: (1) by four years of high school transcripts showing that the student has completed four years in one language or two years in each of two languages; (2) by taking, in college, one language or three quarters in each of two languages; (3) by combination of high school and University foreign language study acceptable to the anthropology department as the equivalent of (2) above; and (4) in exceptional cases, by passing a reading examination at the level of attainment expected of a student who has passed at least five quarters of a foreign language at this University.

Linguistics is the science which investigates the structure of 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 state theories of language universals. Knowledge of foreign languages is important for many other disciplines and has various applications, particularly in teaching English and foreign languages. Although at present the University does not offer a 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 general government and foundation supported language programs in the U.S. and abroad. Refer to the Departments of Anthropology, English, Foreign Languages, Speech Communication, and Speech Pathology and Audiology for course offerings in linguistics.

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., acculturative transition.

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

242 HUMAN PALEONTOLOGY 4. prereq 152. Review of the morphological development of man and his capacity for culture using paleontological evidence and modern evolutionary theory.

250 ANTHROPOLOGICAL ECOLOGY 3. prereq 152. Survey of theories, methods and philosophies of ecological perspective to cultural and physical attributes of human populations.

244 INTRODUCTION TO ARCHAEOLOGY 3. prereq 152. Method and theory in archaeology: the reconstruction of past cultures.

251 PRIMITIVE TECHNOLOGY 3. prereq 152 and c/i. Technological processes used by people in preliterate societies and early civilizations.

252 COMPARATIVE SOCIAL ORGANIZATION 4. prereq 152. The social organization of man—generally, social organizations—economic life, religion, political forms, education and arts.

255 INTRODUCTION TO FAR EASTERN CULTURE 4. prereq 152. 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 identical Sociology 306.)

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

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, and FOR GRADUATES. Courses listed under the 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 indication 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:

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

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 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 other courses as a prerequisite. In these cases, pre­ req, 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.
340 *PRIMITIVE RELIGION 3 prereq 152 and 252. Theories and practices of the supernatural phenomena found among primitive peoples throughout the world.

343 *CULTURES 3 prereq 152. Prehistoric man and his cultures, up to the Neolithic, in Europe and the Near East.

352 *ARCHEOLOGY OF MONTANA 3 prereq 152 or 244 or c/l. The origins and distributions of aboriginal cultures in Montana and surrounding regions. Students are required to attend a minimum of three field trips in which actual archaeological sites will be excavated and techniques demonstrated.

353 ARCHAELOGICAL SURVEY Any quarter in which field parties are organized. V 3-4 R-15 prereq 152, 244 and c/l. A field course in Montana archeology.

354 *OLD WORLD ARCHEOLOGY 4 Su 3 prereq 152 and 244 or c/l. The development of civilization from the Neolithic Age to the dawn of written history.

355 *ARCHEOLOGY OF NORTH AMERICA 4 prereq 152 and 244 or c/l. The origins, backgrounds and development of pre-Columbian American peoples and cultures.

356 HISTORICAL ARCHEOLOGY 3 prereq 152 and 244 or c/l. 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.

358 PHYSICAL ANTHROPOLOGY 4 prereq 152 and 242 or c/l. Primate and human evolution; human genetics; human ecology; osteology and anthropometry.

360 *INDIANS OF THE SOUTHWESTERN UNITED STATES 3 prereq 152 and 252 or c/l. The development of Indian cultures in southwestern United States from the most ancient evidence of man to the present.

361 INDIANS OF NORTH AMERICA 4, Su 3 prereq 152 and 252 or c/l. The native cultures of North America, north of the Rio Grande.

362 *INDIANS OF SOUTH AMERICA 4 prereq 152 and 252 or c/l. The native peoples of the Indians of South America.

363 *PEOPLES OF AFRICA 4, Su 3 prereq 152 and 252 or c/l. The aboriginal cultures of Africa.

364 PEOPLES OF INNER ASIA 4 prereq 152 and 252 or c/l. The social structures, religion, and subsistence patterns of Inner Asia.

365 *INDIANS OF MONTANA 3 prereq 152 or 10 credits in social sciences, and c/l. The history and culture of the Indian tribes of Montana.

366 *PEOPLES OF THE PACIFIC 4 prereq 152 and 252 or c/l. The peoples who inhabit the islands of the Pacific Ocean, including Polynesia, Micronesia, Melanesia and the larger islands in and around Australia.

369 *PEOPLES OF CENTRAL AMERICA 4 prereq 152 and 252. The prehistoric remains of high civilizations, ethnic groups, and the effects of European contact on these cultures.

371 CULTURE AND PERSONALITY 4 prereq 152 and 252 or c/l. The role of culture in the formation of personality.

372 CULTURE AND THEORY 4 prereq 152 and 252 and Soc. 310. The development of theory and method in cultural anthropology to the present. Various anthropological, sociological, and socio-psychological theories in the light of historical anthropology.

375 APPLIED ANTHROPOLOGY 3 prereq 152 or c/l. Analysis of case material in which anthropological assumptions, facts, theories and methods have been applied to implement desired socio-cultural change. Problems of cross-cultural conflict and adjustment. Relevant anthropological and sociological knowledge to native administration and current research.

383 LANGUAGE AND CULTURE 3 prereq 119 and c/l. Analysis of relationships between languages and cultures of the world. (Also listed as Social Science 119).

385 PEOPLES OF THE FAR EAST 4 prereq 152 and 252 or c/l. The peoples and culture of China, Japan, Korea, Southern Asia, and adjacent areas.

386 PEOPLES OF WESTERN ASIA 4 prereq 152 and 252 or c/l. The peoples and culture of the area from the Mediterranean near East to India.

387 PRIMITIVE ART (See Art 387).


440 ANTHROPOLOGY OF THIRD WORLD PEOPLES 3 prereq 152 and 252. Comparisons of "peasant" societies with preliterate and industrial societies. Peasant movements, modernization problems and current research.

451 ADVANCED PROBLEMS V I-2 R-6 prereq 152 or 153 or c/l.

452 MODERN INDIAN LANGUAGES 3 prereq 152 and 252 or c/l. Social and health problems, legislation and education, and economic conditions of Indians of the United States.

453 SOCIAL ANTHROPOLOGY 3 prereq 152 and 252. The principles of theory and social organization and institutions.

454 POLITICAL ANTHROPOLOGY 3 prereq 152, 252, 453 or c/l. Comparison and analysis of political structure, leadership, legal systems and processes among selected peoples of the world.

473 CULTURAL DYNAMICS 3 prereq 152 and 252. The processes of cultural change, acculturation and integration.

480 *LINGUISTIC METHODS 3 prereq 383 and c/l. Phonemic, morphological and semantic analysis of an unwritten language, using a native informant. (Also listed as Speech Communication 486.)

481 AMERICAN INDIAN LANGUAGES 3 prereq 119, 383. Analysis and characteristics of American Indian languages in historical perspective.

482 ANTHROPOLOGICAL RESEARCH METHODS 5 prereq 152, Soc 250. Field methods, laboratory techniques, controlled comparisons and cross-cultural methodology.

485 CHINESE SOCIAL CHANGE 4 prereq 152 and 255. Emphasis on recent revolutionary periods in mainland China and Taiwan.

496 PROBLEMS IN ASIAN ETHNOLOGY V 1-2 prereq 152, 285, 493 and c/l. Independent research and seminar discussion.

490 HUMAN VARIATION I 3 prereq 152, 242, 358. First quarter in a one year sequence (490, 491, 492) devoted to genetic, development and adaptation of Homo sapiens and the environmental bases of human variation and physiological adaptation. Emphasis in 490 upon mechanism and processes of variation and adaptation.

492 HUMAN VARIATION II 3 prereq 490. Second quarter of 490, 491, 492 sequence. Emphasis upon types and distribution of variation.

493 HUMAN VARIATION III 3 prereq 491. Third quarter of 490, 491, 492 sequence. Emphasis on current research, method and theory.

494 HISTORY OF PHYSICAL ANTHROPOLOGY 4 prereq 242, 358. A review of historical development of the several approaches to the study of biological man: evolution, paleontology and taxonomy, anthropometry and somatology, primatology, ethnology, genetics, physiological variation, ecology, epidemiology, and research.

FOR GRADUATES

530 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.

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. It 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 Fine 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. The following requirements must be completed for the Bachelor of Arts degree with a major in Art: 70 credits in Art: First Year Studio 15 er.; second year, Art History 9 er., Photography 3 er., Ceramics 2 er., Painting 3 cr., Sculpture 4 cr.; third and fourth year, Adv. Art History 6 cr. and Art electives 25 cr. One quarter of English composition must be completed.


A student may elect either the B.A. or the B.F.A. program.

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

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

123 FIRST YEAR STUDIO V R-15.

129 CERAMICS 2 R-4 prereq 10 credits 123. Offered for one credit by extension.

160 LAYOUT AND LETTERING 2 R-6.

200 SURVEY OF WESTERN ART: THE ANCIENT WORLD 3.

201 SURVEY OF WESTERN ART: EARLY CHRISTIAN TO MANIRNESSM 3.

202 SURVEY OF WESTERN ART: MANNERISM TO PRESENT 3.
ASTRONOMY—17

ASTRONOMY

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 high school preparation include advanced algebra and solid geometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation earlier in the catalog, fifty-five credits in physics and astronomy courses are required for the Bachelor of Arts degree with a major in astronomy. These physics credits should include Math 251-252-253, Math 351, 352, 362, 363-364-365, plus additional astronomy courses of the student’s choice. In addition, the prospective astronomer must take Physics 221-222-223 plus one of the following sequences: Physics 314-315-316, 229-230-231 or 240, 239. Students planning to go on to graduate study in astronomy are urged to take as many upper-division physics and mathematics courses as possible.

Required courses offered by other departments are: Mathematics 121, 151-152-153 and 251-252-253, and Computer Science 201.

Knowledge of a modern foreign language is required. This requirement can be satisfied by either (1) taking in the University, five quarters of one language or three quarters of each of two languages, or (2) by a combination of high school and University foreign language study acceptable to the Foreign Language Department as equivalent to (1).

A total of nine credits in English including English 100 and 450 are required, except that the students scoring less than the thirty-first percentile on the English section of the ACT test are required to take English 001, and students receiving the ninety-fourth percentile or higher are exempt from English. Recommended courses in other departments include eight credits of Computer Science courses beyond CS 201. Mathematics 311-312-313, and ten credits each in the Humanities, Social Sciences, and Life Sciences groups.

FOR UNDERGRADUATES


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 comets, suns, 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, brightnesses, colors, and 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. Detailed account of physical laws to determine the nature of stars; analysis of stellar spectra; structure of stars and their evolution; galactic structure and cosmology.

450 SPECIAL PROBLEMS IN ASTRONOMY 1-5 R-10 prereq 15 credits of astronomy and c/l. Research or directed reading in selected areas of astronomy or astrophysics.


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, A and B, 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 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 3 years of mathematics. It is 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 on the liberal arts page, the following additional requirements must be completed for a Bachelor of Arts Degree with a major in Biology: 55 or more credits in Biology including Botany-Zoology 111 (Introduction to Biology); Botany 111, 114, 115, 116, 117, 118 (General Botany); Microbiology 200 (General Microbiology); Zoology 112, 113, 115 (General Zoology); Zoology-Botany 330 (Cellular Biology); Zoology-Botany 485 (Genetics) and 10 additional credits in 300 and 400 level courses in biological sciences (Recommended: Botany 340, 403, 404; 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 Chemistry); Physics 160, 260 (Physics); or Mathematics 116, 117, 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 111, 114, 115, 116, 117, 118 (General Botany); Zoology 112, 113, 115 (General Zoology); Botany-Zoology 330 (Cellular Biology); Zoology-Botany 485 (Genetics) and 10 additional credits in 300 and 400 level courses in biological sciences (Recommended: Botany 340, 403, 404; Zoology 331). Chemistry 370, 481 also recommended.

The following courses in allied sciences must be completed by students electing the Environmental Biology Option: Chemistry 101, 102, 160 or Chemistry 111, 112, 123; Physics 110, 111 or 115; Math 105, 107, 108, 109, 125. Recommended electives include: Geology 103; Geography 105, 201, 301; Earth Science 101; Computer Science 101 (Fortran); Sociology 310 (Human Ecology); Forestry 210 (Forest Soils); Forestry 370 (Wildlife Management). The Life Science Curriculum Committee, representing the departments of Zoology, Microbiology, Psychology, and Botany, in cooperation with the Biology Committee recommends that Biology (Option A and B) majors should meet the following language requirement: Completion of the following work in one of the two tracks (reading skills or active skills) in one foreign language: Reading skills: 5 quarters in Russian (includes reading and active skills) or 4 quarters in German or 3 quarters of Italian or Spanish or French.

Active skills: At least 5 quarters of the active skills track in German, Italian, Spanish, or French.

Suggested first year program for Options A and B:

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<thead>
<tr>
<th>Course</th>
<th>Options A</th>
<th>Options B</th>
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<tr>
<td>Botany-Zoology 111</td>
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<td>Botany 111</td>
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<td>Math 116, 117, 118</td>
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<td>Chemistry 101, 102, 160</td>
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<td>Chemistry 112, 125</td>
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<td>Electives</td>
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Black Studies

See Liberal Arts page

Botany is the study of various aspects of plant life, such as form, structure, physiology, reproduction, classification, evolution and distribution. The study of plants provides any educated person with a better understanding of natural environments and a greater comprehension of general biological principles. It is a basic science for many professional fields such as forestry, pharmacy, agriculture, horticulture, plant pathology and plant breeding. Students majoring in Botany will also prepare the student to make satisfying use of such leisure time activities as gardening, landscaping and other forms of outdoor recreation.

Employment opportunities for both men and women trained in botany are available in numerous fields. Graduates in botany may find employment as biology teachers in high schools, or in research institutes and government agencies such as the Forest Service, experimental stations, Park Service, and other agencies, or in industrial establishments such as pharmaceutical, food, drug, paint, seed and oil companies, florists and nurseries. Good students are encouraged to go into graduate work. The better positions in the fields require a master's or doctor's degree. For most teaching positions in colleges and universities the doctorate is essential.

High School Preparation. In addition to the general requirements for admission to the University, the student needs 3 years of mathematics. It is also recommended that the high school preparation include a modern foreign language.

Special Requirements for the Undergraduate Degree in Botany. In addition to the general requirements for graduate school preparation, the following additional requirements must be completed for the Bachelor of Arts degree with a major in Botany: 45 credits in Botany including Botany 111, 114, 115; 65 or more credits in Botany including Botany 111, 114, 115; 2 credits of 495 and at least one course from each of the following groups: (1) Morphology 441, 442, 443, 444, 478, 485, 486; (2) Physiology 330, 331, 332, 334, 336; (3) Ecology 350, 355, 360; (4) Analytical Chemistry 455, 456, 457; (5) Taxonomy 385, 386, 388, 389; and (6) Genetics 485, 486, 487.

Also required are 60 credit hours in allied sciences to be selected by the student in consultation with his advisor from courses in the fields of mathematics, chemistry, physics, computing science, and the other biological sciences, with the exclusion of those courses not allowed for credit toward the degree in those subjects or those courses for education students or non-science majors. Most graduate schools and professional employers require college preparation in mathematics, physics, chemistry and biology. Students are therefore strongly advised to take a full year of courses in each of these subjects.

In addition it is strongly recommended that at least 50 credits be selected from outside of the major and allied fields. The student will choose courses that can be arranged to fit his needs. In some fields as foreign languages, English composition, the humanities, fine arts and the social sciences.

Courses 265, 355, 385, 370, 441 may require field trips extending some miles from the campus. Students are required to pay their pro rata share of transportation, insurance, etc, costs for such trips.

For Undergraduates

For explanation see Course Descriptions (Index)

100 Field Botany 3 (0-6): The collection, preservation and identification of plants and consideration of their groups. Given only as an extension course. Credit not allowed toward degree in Botany.

111 Introduction to Biology 5 (3-4): The basic principles of biology including population biology, genetics, the origin of life, and mechanics of evolution and adaptation. Credit not allowed for this course and Zoology 111.

114 General Botany 5 (3-4) Prereq 111 or 110: The morphology, reproduction and evolutionary relationships of the various plant groups.

115 General Botany 5 (3-4) Prereq 114 or 110: The anatomic, physiological and ecological aspects of the major groups in Botany, Microbiology or Zoology. Credit not allowed for this course and Botany or Zoology 111. Same as Zoology 131.

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. Same as Zoology 131.
126. EVOLUTION, GENETICS AND MAN 3 prereq Bot 131 or =. Evolution, especially as related to man and including evidence, mechanisms, genetics, nature of hereditary material and adaptation. Not considered toward a major in Botany, Microbiology or Zoology. Same as Zoology 132.

170. SURVEY OF WILDLIFE CAREERS 1 (1-0). Also listed as Forestry 170 and Zoology 170.

250. BASIC CONCEPTS OF ECOLOGY 3 (3-0) prereq one year of college biology and calculus with emphasis on principles of ecology. (Credit not allowed for this course and Zool. 250.)

251. ELEMENTARY ECOLOGY LABORATORY 2 (0-4) prereq or coreq 250. Population and community composition, distribution, and interrelationships with environmental factors. Field work included. (Credit not allowed for this course and Zoology 251.)


FOR UNDERGRADUATES AND GRADUATES

235 (225). PLANT PHYSIOLOGY 5 (3-4) prereq 115 and Chem 160 or 125. The chemical and physical basis of metabolism, photosynthesis, nutrition, water relationships and growth of plants.

300. CELLULAR PHYSIOLOGY (see Zoology)

314. MICROSCOPIC METHODS 3 (1-4) prereq 15 cr. in Botany. Techniques of preparing cleared whole mounts, cytological squashes, woody plant sections and wood maceration of wood; use of freezing, sliding and rotary microtomes.

355. PRINCIPLES OF PLANT ECOLOGY 5 (1-8) prereq 250, 251 and 325. Field and laboratory analysis of methods used in the description and interpretation of plant and environmental interrelationships.

365. FUNDAMENTALS OF SYSTEMATICS 4 (3-2), prerequisite 1 year of biology. Principles and practice of the classification and nomenclature of organisms with an introduction to contemporary evolutionary thought and approaches to systematics.

367. AGROSTOLOGY 5 (2-6) or =. Identification, classification and cultural aspects of grasses, sedges, grasses, and rushes. (Given for 3 cr. at the Biological Station).

368. AQUATIC FLOWERING PLANTS 3 (0-7) prereq 265 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/l. Basic principles and skills of producing illustrative materials relevant to the biological sciences. (825 special supplies fee. Credit not allowed for this course and Zool 403.)

421. MINERAL NUTRITION 5 (3-4) or prereq 325. The absorption, translocation and utilization of minerals by plants: mineral requirements of plants; research methods in plant tissue analysis and the effects of local or general deficiencies on plant growth.

427. PLANT VIRUSES 4 (2-4) prereq 115 or =. Micro 420. Plant viruses and the diseases which they cause. The isolation, purification, identification, and host ranges of selected plant viruses.

428. ALGAL PHYSIOLOGY 5 (3-4) prereq 265, 441 or c/l. Comparative ultrastructure, photosynthetic pigments and physiology of the photosynthetic bacteria and algae with special emphasis on the algae and their relationships to both the bacteria and higher plants.

429 (329). PROBLEMS IN PLANT PHYSIOLOGY V 1-6 (0-3/cr) R-6 prereq 255 and c/l. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant physiology not taken up in regular courses.

433 (333). MORPHOGENESIS 5 (4-3) or prereq 325 or =. The effect of internal and external factors on the growth and forms of organisms.

435 (355). PLANT ANATOMY 5 (2-6) or, prereq 115 or =. The origin of organs and tissues and the anatomy of vascular plants.

437. CYTOLOGY 5 (3-4). Fine structure of cells and its relationship to function. Introduction to light, phase, and electron microscopy. Prerequisite 1 yr. biology, Chem 160 or c/l.

439 (339). PROBLEMS IN PLANT ANATOMY AND CYTOLOGY 1-6 (0-3/cr) R-6 prereq 435, 436 or 437 and c/l. 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). PHYCOLOGY 5 (2-6) or prereq 115 or =. Morphology, taxonomy and ecology of the algae, especially of the northern Rocky Mountains (given for 6 credits at the Biological Station).

442 (363). BRGYOLOGY 5 (2-6) or prereq 115 or =. The morphology, taxonomy and ecology of the bryophytes, especially of the northern Rocky Mountains (given for 3 credits at the Biological Station).

445 (348). SPERMATOPHYES 5 (2-6) or prereq 115 or =. The morphology and life histories of the gymnosperms and angiosperms.

449 (349). PROBLEMS IN PLANT MORPHOLOGY V 1-6 (0-3/cr) R-6 prereq 441, 442 or c/l. 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 3 (3-2) prereq Math 118, 123, Computer Science 201, Botany 355 or =. Mathematical analysis of ecological principles using mathematics models, computer simulation, optimization of systems.

455. BIOLOGICAL EFFECTS OF AIR POLLUTION 5 (2-6) c/l. Air monitoring for pollutants using selected vegetation; use of a controlled environment fumigation chamber, and analysis of specimens collected in industrially polluted areas.

456. BOTANICAL EFFECTS OF WATER POLLUTION 5 (2-6) c/l. Analysis of water with aquatic vegetation for pesticides, heavy metals, phosphates, nitrates, etc.

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

469 (369). PROBLEMS IN PLANT TAXONOMY V 1-6 (0-3/cr) R-6 prereq 255 and c/l. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant taxonomy not taken up in regular courses.

473 (375). MYCOLOGY 5 (3-4) or 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 V 1-6 (0-3/cr) R-6 prereq 255 and c/l. 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 (3-4) or prereq 115 or =. An introduction to the study of fossil plants.

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

485 (385). GENETICS. (See Zoology.)

486. (386). EVOLUTION 3 (2-0) prereq 265, 485; Zoo 113. The nature of and processes by which evolution occurs. (Credit not allowed for this course and Zool 486.)

487. CYTOGENETICS 5 (3-4) or prereq 485 or =. The structure and design of chromosomes from bacteria to higher organisms. Chromosomal aberrations and their relation to evolution and disease. (Credit not allowed for this course and Zoology 487.)

488. POPULATION AND ECOLOGICAL GENETICS 5 (5-0) prerequisite 485 or =. Genetic structure of populations. Dynamics of natural selection and adaptation. Same as Micro 488 and Zool 488.

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

490. SEMINAR IN BIOLOGY 2 (2-0) R-4. (Credit not allowed for this course and Zool. 490).

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

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

FOR GRADUATES

502. HISTORY AND DEVELOPMENT OF BIOLOGICAL CONCEPTS 3 (3-0) prereq graduate standing in a biological science. (Credit not allowed for this course and Zool. 502.)

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 visible light on plants, animals, and microorganisms. (Credit not allowed for this course and Zoology 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 Zoology 524.)

551. GENERAL ECOLOGY 6 (4-15) prereq Bachelor's degree: major preparation in Botany, Biology, or Zoology. Community concepts, concepts in effect of light, adaptation, population, structure and energy relationships, introduction to population problems. Offered at the Biological Station. (Credit not allowed for this course and Zool 551.)

556. ADVANCED SYSTEMATICS. Continuation of 365 with emphasis on the methodology, technology, and application of systematic, chemistry and other modern approaches to systematics.

565 (465). PHYTOGEOGRAPHY 4 (4-0) or prereq 355, 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 core of basic 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 (with concentrations in accounting, business education, computer systems, finance, management, or marketing). The MBA program is particularly suited to those students whose undergraduate training has been 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 in basic liberal education 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.

Pre-business administration requirements include: English 100; Mathematics 116, Economics 101; and Chemistry 482 or C/I. Development familiarity with modern biochemically oriented research, techniques. Cross listed with chemistry, microbiology, pharmacy and zoology.

ADMISSION AND GRADE POINT 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 in the School 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.

PASSED/NOT PASSED OPTION

Courses in the School of Business Administration are available on a Passed/Not Passed basis as follows:

For Non-Business Majors: All 100, 200, 300 and 400 level Business Administration courses are available on a Passed/Not Passed basis.

Business Majors: All courses except those in (a) the pre-business and upper division core curriculum, and (b) the courses in the student area of major concentration are available on a Passed/Not Passed basis.

Exemptions to the above, for Business majors, may be made by the instructor with the approval of his department.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

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

a. Complete the pre-business administration requirements.

b. Complete core courses: Economics 301, Bus Ad 322, 340, 342, 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, Management—Option A, B or C, Office Administration. This selection of an area of concentration is to be indicated by completing a prescribed form available in the office of the Dean of the 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 selected.

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 473, 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.

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</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 203-Accounting Principles III</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 303-304-Cost Accounting I and II</td>
<td>6</td>
</tr>
<tr>
<td>Bus. Ad. 308-Special Problems in Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 401-402-Income Tax I and II</td>
<td>6</td>
</tr>
<tr>
<td>Bus. Ad. 412-Accounting Theory</td>
<td>3</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</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 305-Governmental Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 330—C.P.A. Professional</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 405-406—Auditing I and II</td>
<td>6</td>
</tr>
<tr>
<td>Bus. Ad. 410—Consolidated Statements</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 418—C.P.A. Review</td>
<td>3</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</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 182—Production Typewriting</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Ad. 184—185—186—Stenography</td>
<td>18</td>
</tr>
<tr>
<td>Bus. Ad. 192—Beginning Secretarial Practice</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 194—Records Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 205—Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 292—Office Machines Practice</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Ad. 291—Methods of Teaching Bookkeeping and Business Education</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Ad. 332—Office Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 384—Methods of Teaching Shorthand and Transcription</td>
<td>2</td>
</tr>
</tbody>
</table>

35
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 relationship to banking and other financial institutions as well as to acquaint students with the concepts and methods relevant to financial analysis and management.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 301</td>
<td>Management Accounting</td>
<td>4</td>
</tr>
<tr>
<td>Bus. Ad. 323</td>
<td>Commercial Banking</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 420</td>
<td>Investments</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 429</td>
<td>Theory of Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 430</td>
<td>Principles of Insurance and Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 422</td>
<td>Problems in Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 428</td>
<td>Analytical Methods in Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 447</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

*Students are advised to take Econ 311 before BA 447.

Option B. Insurance

This curriculum provides students 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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 320</td>
<td>Principles of Insurance and Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 328</td>
<td>Life and Health Insurance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 327</td>
<td>Property and Casualty Insurance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 334</td>
<td>Real Estate Law</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 335</td>
<td>Management of Financial Institutions</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 401</td>
<td>Income Tax I and II</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 426</td>
<td>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 use.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 324</td>
<td>Real Estate Law</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 432</td>
<td>Money and Capital Markets</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 425</td>
<td>Real Estate Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 426</td>
<td>Property Valuation Theory</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 427</td>
<td>Property Management</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 386</td>
<td>Land Economics</td>
<td>3</td>
</tr>
<tr>
<td>Soc. 387/388/389</td>
<td>Seminar in Urban Studies (anyone of the three)</td>
<td>21</td>
</tr>
</tbody>
</table>

MANAGEMENT

This curriculum is designed to equip students with the analytical, integrative, and interpretive skills to enable students to assume managerial roles 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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 301</td>
<td>Management Accounting</td>
<td>4-6</td>
</tr>
<tr>
<td>or</td>
<td>BA 203—Accounting Principles III and one additional course in accounting</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>BA 362—Analysis of Consumer Behavior</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>BA 363—Analysis of Marketing Communication</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td>BA 422—Problems in Finance</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td>BA 441—Personnel Administration</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td>BA 447—Managerial Economics</td>
<td>4</td>
</tr>
</tbody>
</table>

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

A. Personnel and Industrial Administration

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 442</td>
<td>Personnel Management</td>
<td>4</td>
</tr>
<tr>
<td>BA 444</td>
<td>Regulation of Industry</td>
<td>4</td>
</tr>
<tr>
<td>Econ 321-322</td>
<td>Labor Economics</td>
<td>6</td>
</tr>
<tr>
<td>Econ 424</td>
<td>International Economics</td>
<td>4</td>
</tr>
<tr>
<td>Engl 450</td>
<td>Problems in Composition</td>
<td>3</td>
</tr>
<tr>
<td>Psych 342</td>
<td>Personnel Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Psych 343</td>
<td>Industrial Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Marketing

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 362</td>
<td>Analysis of Consumer Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BA 263</td>
<td>Analysis of Marketing Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 269</td>
<td>Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>BA 444</td>
<td>Regulation of Industry</td>
<td>4</td>
</tr>
<tr>
<td>BA 460/461</td>
<td>Marketing Management</td>
<td>6</td>
</tr>
<tr>
<td>BA 462</td>
<td>Pricing Policies and Practices</td>
<td>3</td>
</tr>
<tr>
<td>Engl 450</td>
<td>Problems in Composition</td>
<td>3</td>
</tr>
</tbody>
</table>

C. Computer Systems

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 371</td>
<td>Introduction to Cobol Programming</td>
<td>2-3</td>
</tr>
<tr>
<td>CS 212</td>
<td>Cobol</td>
<td></td>
</tr>
<tr>
<td>BA 470</td>
<td>Analysis and Design of Business Systems</td>
<td>3</td>
</tr>
<tr>
<td>BA 475</td>
<td>Computer Simulation of Business Systems</td>
<td>3</td>
</tr>
<tr>
<td>CS 301</td>
<td>Programming</td>
<td>3</td>
</tr>
<tr>
<td>CS 374</td>
<td>Application of Digital Computers</td>
<td>4</td>
</tr>
</tbody>
</table>

OFFICE ADMINISTRATION

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus. Ad. 183</td>
<td>Production Typewriting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 184-185-186</td>
<td>Stenography</td>
<td>15</td>
</tr>
<tr>
<td>Bus. Ad. 187-188</td>
<td>Production Stenography</td>
<td>10</td>
</tr>
<tr>
<td>Bus. Ad. 190-191</td>
<td>Advanced Shorthand Transcription</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Ad. 195</td>
<td>Beginning Secretarial Practice</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 198</td>
<td>Records Management</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 203</td>
<td>Elementary Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 382</td>
<td>Office Practice</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Ad. 385</td>
<td>Office Management</td>
<td>3</td>
</tr>
</tbody>
</table>

*Bachelors of Arts in Business Administration

The requirements for the degree of Bachelor of Arts in Business Administration are identical to those for the degree of Bachelor of Science in Business Administration except that, in addition, the candidate must satisfy the foreign language requirement.

ACCOUNTING

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

201 ACCOUNTING PRINCIPLES I 3.

202 ACCOUNTING PRINCIPLES II 3 prereq 201.


FOR UNDERGRADUATES AND GRADUATES

Bus. Ad. 301, 303, 306, and 401 are available for graduate credit to non-accounting majors only.

301 MANAGEMENT ACCOUNTING 4 prereq 202. Open only to non-accounting majors. Accounting for management planning and control. (Credit not allowed for both Bus Ad 301 and 303-304.)

303 COST ACCOUNTING I 3 prereq 302. Development and application of cost systems. Analysis of cost behavior and use of cost information by management. (Credit not allowed for both Bus Ad 301 and 303-304.)

304 COST ACCOUNTING II 3 prereq 303. Continuation of 303. (Credit not allowed for both Bus Ad 301 and 303-304.)

305 GOVERNMENTAL AND INSTITUTIONAL ACCOUNTING 3 prereq 303. Study of planning and budgeting processes in governments and in institutions.

306 INTERMEDIATE ACCOUNTING I 4 prereq 303. The fundamentals of valuation as applied to the balance sheet, and income determination as related to the operating statement.

307 INTERMEDIATE ACCOUNTING II 4 prereq 306.

308 SPECIAL PROBLEMS IN ACCOUNTING 3 prereq 307.

401 INCOME TAX I 3 prereq 302. The application of the federal income tax law as applied to individuals.

402 INCOME TAX II 3 prereq 401. Continuation of 401 applied to corporate and partnership tax problems. Special problems of feder al estate and gift taxes.

403 AUDITING I 3 prereq 307. Scope and professional responsibilities of the independent public accountant as related to the examination of financial statements.

404 AUDITING II 3 prereq 403.

410 CONSOLIDATED STATEMENTS 3 prereq 307.

412 ACCOUNTING THEORY 3 prereq 307. A critical analysis of the concepts underlying the development and application of generally accepted accounting principles.

417 ACCOUNTING INTERNSHIP 3 prereq c/i. Students are placed with public accounting firms to receive training during the winter quarter. Written reports are required.


490 SEMINAR V R-4.

504 THEORY OF INCOME DETERMINATION 3 prereq 412. The theories underlying the calculation and disclosure of periodic net income. Economic, legal and tax concepts of income.

505 MANAGERIAL ACCOUNTING 3. Principles of financial accounting as a basis for understanding management's need for financial statements.

506 MANAGERIAL ACCOUNTING 3 prereq 505 or =. The use of accounting data as a tool for management decision-making purposes.

599 RESEARCH V R-6. Special research problems.

505 ADMINISTRATIVE ACCOUNTING CONTROLS 3 prereq 506. The functional responsibilities of the controller in providing an effective information system for over-all financial planning and control.

690-691-692 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.

For Undergraduates and Graduates

320 PRINCIPLES OF INSURANCE AND RISK MANAGEMENT 3 prereq Econ 203. The functions of risk management coupled with the rudiments of the primary kinds of insurance.

322 BUSINESS FINANCE 3. Theory and practice in managing the financial affairs of a business enterprise.

323 COMMERCIAL BANKING 3. Policies and practice in commercial bank management.

324 REAL ESTATE LAW 3. Interests in real property, forms of ownership, conveyancing, recording and evidence of title, contracts, mortgages, personal property and fixtures, liens, landlord and tenant, restrictions and zoning, eminent domain, brokerage relationship.

325 MANAGEMENT OF FINANCIAL INSTITUTIONS 3 prereq 322 and 325. Analysis of case problems in the management of commercial banks, savings and loan associations, life insurance companies and other financial institutions.

326 LIFE AND HEALTH INSURANCE 3 prereq 320. Analysis of individual and group life, health, and accident contracts, pensions and annuity programs.

327 PROPERTY AND CASUALTY INSURANCE 3 prereq 320. The management of risk originating from ownership, maintenance, and use of property.

329 THEORY OF BUSINESS FINANCE 3 prereq 322. Theory relating to the composition of capital, optimal use of leverage, dividend policy, and capital investments.

420 INVESTMENTS 3 prereq 322 and Econ 301. Principles of security analysis and portfolio management.

421 (522) SECURITY ANALYSIS 3 prereq 420. Advanced techniques in security valuation and portfolio management.

422 (451) PROBLEMS IN FINANCE 3 prereq 322. Analysis of case problems in financial management.

423 ADVANCED PROBLEMS IN FINANCE 3 prereq 422. Comprehensive analysis of problems in corporate financial management.

424 MONEY AND CAPITAL MARKETS 3 prereq 322 and Econ 301. Institutional and theoretical analysis of domestic and international money and capital markets.

425 REAL ESTATE FINANCE 3 prereq 322, 344. Sources and uses of funds related to financing the industrial, commercial, and residential segments of the real estate market.

426 (Ec 387) PROPERTY VALUATION THEORY 3 prereq Econ 385. The analysis and comparison of the various theoretical bases for the determination of real estate values.

427 PROPERTY MANAGEMENT 3 prereq 324. The elements of management applied to acquisition, preservation, development, and maintenance of common kinds of real property.

428 SOCIAL INSURANCE 3 prereq 320. An examination of the ways in which individual economic security is enhanced by insurance programs in the private and public sectors.

439 (459) ANALYTICAL METHODS IN FINANCE 3 prereq 322 and 326.

499 SEMINAR V R-4.

323 FINANCIAL MANAGEMENT 3. Techniques of corporate financial management.

599 RESEARCH V R-5. Special research problems.

681 PROBLEMS IN FINANCIAL MANAGEMENT 3 prereq 322 and 523 or =. Advanced theory and analysis in corporate financial management.

690-691-692 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.

For Undergraduates

410-411-412 BUSINESS STATISTICS 4 prereq Math 116. Elements of descriptive statistics, probability, probability distributions, estimation and confidence intervals, statistical inference and hypothesis testing, and sampling. Three hours lecture and two hours lab.

525 BUSINESS STATISTICS 3 prereq BA 250. Formulation, development, and analysis of business and economic models. Correlation, regression, Markovian chains, time series, index numbers, decision theory, and an introduction to nonparametric statistics.

341 INDUSTRIAL PURCHASING AND TRAFFIC MANAGEMENT 4 prereq 340. Current problems and problems in the industrial production areas of: materials procurement, inventory controls, warehousing, materials handling.

357 LEGAL ENVIRONMENT OF BUSINESS 3 prereq all pre­ business requirements. Foundations and theoretical background related to the business environment. What law is, sources and classifications of law, legal reasoning, and legal process. Principles of tort and criminal law, trends in law and business.

358 LEGAL ENVIRONMENT OF BUSINESS 3 prereq 357. Legal principles relating to business transactions: contracts, agency business, organizations, negotiable instruments, real and personal property and security devices.

359 C.P.A. LAW REVIEW 3 prereq 358. The legal theory and principles relating to bankruptcy, unfair competition, sureties, secured transactions, court's equitable and common law, wills and intestacy. (Primarily for accounting majors intending to take the CPA examinations, but open to all students.)

370 ELECTRONIC INFORMATION PROCESSING 3 prereq all pre-business requirements. Modern business data processing techniques, new developments and tools for management information, computer equipment and logic, programming, and information flow analysis. 2 hours lecture, 2 hours laboratory.

371 INTRODUCTION TO COBOL PROGRAMMING 2 prereq Math 101 or =. Primarily for students in Business or Economics. Course will be developed with the assistance of the computer center. (Credit not allowed for both Bus Ad 371 and CS 212.)

For Undergraduates and Graduates

340 PRODUCTION MANAGEMENT 3 prereq all pre-business requirements. Management process applied to design and operation of a production system—production as a function of the business rather than as a strictly manufacturing activity; and research and development, the role of standards, physical facilities, materials management, process design, production planning and control.

342 ORGANIZATIONAL HUMAN RELATIONS 3 prereq all pre-business requirements. Selected general behavioral models, with emphasis on perceptual, motivational, and attitude change processes. Application of psychological and social psychological concepts to management of people in the firm, situational analysis, organizational analysis, problems of delegation of authority and acceptance of responsibility.

344 AMERICAN INDUSTRIES 4 prereq 340, 360. Economic processes and technological processes of selected manufacturing and communications industries. Location factors, company structures, mergers and competition and national policy relating to oligopoly.

350 INTRODUCTION TO OPERATIONS RESEARCH IN BUSINESS 3 prereq BA 250-251 and all pre-business requirements. Modeling and simulation processes, under certainty and uncertainty. Dynamic programming.

353 SAMPLING AND STATISTICAL CONTROL 3 prereq 250 or Math 125. Applications of sampling to business, statistical control of product quality, industrial processes, and inventories.

441 PERSONNEL MANAGEMENT 4 prereq 340 and Psych 110. Personnel function in the industrial organization; selection, employee and executive development, job evaluation, human relations.

442 PERSONNEL MANAGEMENT 4 prereq 441. Analyzing selected problems: job evaluation, executive and supervisory appraisals and development, work simplification and labor management relations.
444 REGULATION OF INDUSTRY 4 prereq 340, 360, and Econ 361. Economic concentration and maintaining competition. Changing regulatory legislation, administrative agencies, national policies and social control.

448 ADMINISTRATION AND BUSINESS POLICIES 4 prereq 340, 360, and Econ 361. (May only be taken in one of last two quarters before graduation.) Top-management oriented to develop on-line reporting and decision support systems. Decision-making processes in analytical tools 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, pricing, quantitative analysis, computerized, production, 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-6 prereq 350 or = or c/r. Practice in the application of selected quantitative techniques to business problems. Topics and projects selected in consultation with the instructor.

479 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, decision tables, data matrices, theoretical 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.

588 RESEARCH METHODS 3. 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 normative analyses of management practices and processes emphasize functions of planning, organizing, directing, and controlling in the enterprise. The interrelationship of 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 in industrial 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 management control systems, emphasizing calculations in 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 sociology.

542 RESEARCH METHODS 3. 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 normative analyses of management practices and processes emphasize functions of planning, organizing, directing, and controlling in the enterprise. The interrelationship of 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 in industrial systems and judging the feasibility of computer processing.

588 RESEARCH METHODS 3. 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.

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 this data. Students will work in groups and 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 remedies for settled disputes, government administrative regulation, and regulatory legislation.

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

570 ELECTRONIC INFORMATION PROCESSING 3. Electronic data processing and information systems for business management. Emphasis is placed on the nature and application of electronic digital computers in information systems. Laboratory sessions would concentrate on computer programming, 3 credits (2 hours lecture, 2 hours laboratory).

599 RESEARCH V R-6. Special research problems.

646 ADVANCED MANAGEMENT PROBLEMS 3. Interdisciplinary approach to the analysis of problems encountered by senior administrators. Determination of objectives, development of policies to achieve objectives; organization of executive personnel to implement policies; coordination and control; organization of management of change in environment.

647 MANAGERIAL ECONOMICS 3. The use of various analytical tools in the decision-making process of business managers; decision-making and selected techniques (operations research, systems analysis, programming, decision theory, statistical methods) with application to dynamic social and industrial environments.

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.

680 BUSINESS AND ITS ENVIRONMENT 3. Institutional and cultural factors, both national and international, which influence industrial leaders in their enterprise and community relations roles.

The social-economic setting: the impacts and significance of population growth, economic-geographic influences, and technological developments. Analytical tools of education's relationship to scientific progress, technological development, innovation and the socio-managerial implications of social and political change.

685 INTERNATIONAL ASPECTS OF BUSINESS 3. Trends and contemporary problems in international operations management, business relations and services, economic policies, and related subjects. Analysis of significant problems facing different institutions, political, social, and economic conditions.

690-691-692 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

530 MARKETING 3. prereq all pre-business requirements. Product policy, channels of distribution, merchandising, marketing institutions, marketing functions, pricing, government regulation.

561 INDUSTRIAL MARKETING 4 prereq 360. Economic factors affecting marketing policy are analyzed. Deals with buying behavior, marketing analysis, industrial distributors, price, markets, and research policies.

563 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.

583 ANALYSIS OF MARKETING COMMUNICATION 3 prereq 360, 361. The broad area of marketing communication is analyzed. Deals with mass media communication and personal communication as they relate to the total marketing process.

586 (486) MARKETING RESEARCH 3 prereq 360. Research techniques and methods are applied to statistical evaluation, experimental, and simulation. Survey of current research practices in marketing and participation in class field project.

598 INTERNATIONAL MARKETING 4 prereq (486) or seniors majoring in Political Science. Theories, principles and methods of international trade.

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

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

462 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, price-quantity curves, marginal analysis, and competitive behavior. Marketing policies and strategies as they relate to competition.

468 MARKET ANALYSIS AND PLANNING 3 prereq 366. Utilization of statistical and accounting techniques in analyzing past and planning future marketing performance.

499 SEMINAR V R-4. FOR GRADUATES

562 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, regulation, and current issues are appraised with special emphasis on the decision-making processes.

588 COMMUNICATION PRACTICES 3. Spoken communication in the organizational setting, in the firm, and in the contemporary world of public speaking and small-group interaction, with emphasis on the latter area.

599 RESEARCH V R-6. Special research problems.

690-691-692 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 190-191, 192, 184-185, 189, 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, completed English 100 or its equivalent, or be concurrently registered in English 100.
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., M.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 enter this program as early as the Winter Quarter of their freshman year. In many cases financial support is available as 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 100 credits including 20 chemistry credits to include Chem 121-122-123, 124-125-126, 245, 246, 264-265-266, 267-268-269, 341-342-343, 351-352-353, 452, 453, 454, and 6 credits selected from Chem 455, 463, 464, 466, 490, or with the consent of the department, from graduate courses in Chemistry. Geol 427, Geol 428, Geol 448, Geol 536, and advanced courses in Mathematics or Physics. Two or three of these credits must be chosen from Chem 455, 466 or 490; 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 three quarters of a foreign language other than German can be used to satisfy this requirement. 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 Bachelor of Science degree except for the deletion of Chemistry 474, 6 credits of advanced Chemistry, Chem 453 and Mathematics 232 or 233. For the B.A. degree, advanced mathematics and/or advanced physics courses may be substituted for Chem 431, 432 and for Mathematics 232 or 233. For the Bachelor of Arts degree with a major in Chemistry see catalog under Education. See also the catalog for the Pre-Med sciences option which follows.

English 100 is required; students competent in composition may be exempt by the Department.

CHEMISTRY CURRICULUM FOR THE B.S. DEGREE

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Cr.</th>
<th>Cr.</th>
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<tbody>
<tr>
<td>Chem 121-122-123</td>
<td>A</td>
<td>W</td>
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<tr>
<td>Chem 124-125-126</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Math 121, 151-152</td>
<td>3</td>
<td>5</td>
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<tr>
<td>English 100</td>
<td>3</td>
<td>5</td>
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<tr>
<td>Electives</td>
<td>3-4</td>
<td>6-7</td>
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<tr>
<td>SPEC</td>
<td>16-17</td>
<td>16-17</td>
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</tbody>
</table>

(Beginning Math course actually dependent on placement test)
Sophomore Year

Chem 294-295-296, and 267, 269, 299
Math 155, 251
Chem 211, 212, 213, and 214-215-216
Physics 122-122-223
Chem 245
Chem 246
Electives

Sophomore Year

Chem 294-295-296, and 267, 269, 299
Math 155, 251
Chem 211, 212, 213, and 214-215-216
Physics 122-122-223
Chem 245
Chem 246
Electives

Junior Year

Math 253 (or 252)
Chem 371-372-373
Chem 341-342-343
Chem 451-452-453
German 101-102-103 (Reading Track)
Electives

Senior Year

Chem 452
Chem 453
Chem 474
Electives (must include 6 cr. of Advanced Chem.)

(Recommended electives include further Mathematics, Physics, advanced Geology and French or Russian.)

CHEMISTRY CURRICULUM FOR THE B.A. DEGREE

Freshman Year

Cr. Cr.
Chem 110-111-112
Chem 121-122-123
Chem 124-125-126
Math 121, 151, 152
English 100
Electives

Sophomore Year

Chem 211-212-213 (or Chem 264, 265, 266)
Chem 214-215-216 (or Chem 267-268-269)
Zool 111-112, 304
Chem 245
Chem 246
Psychology 110
Electives

Junior Year

Physics 221-222-223
German 101-102-103 (Reading Track)
Electives

Senior Year

Chem 342-243
Chem 452
Chem 481, 482
Chem 485
Electives (e.g., Zool. 485)

GRADUATE WORK. See Graduate School Bulletin. For details on the four summer programs leading to the Master of Science for Teachers, write to the chairman of the chemistry department.

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

101-102 GENERAL CHEMISTRY 3 (4-0). The basic laws, properties and reactions of elements and compounds. For students desiring a one year general course only.

105 GENERAL CHEMISTRY LABORATORY 1 (2-0) prereq or coreq 101-102.

121-122-123 COLLEGE CHEMISTRY 3 (4-0). For science majors and those students wishing more than one year of chemistry. The principles and theories of chemistry, properties and relations of elements and inorganic compounds, including qualitative analysis. Students who have completed Chem. 101-102 may not receive credit for 121 and/or 122.

124-125-126 COLLEGE CHEMISTRY LABORATORY 2 (1-4) prereq or coreq 121-122-123.

160 SURVEY OF ORGANIC CHEMISTRY 3 (4-0). Normally to follow Chemistry 101-102 as the 3rd quarter of chemistry for students in non-science majors desiring a one year general course only. Chemistry 160 is also open for credit to students who have completed Chemistry 122 or 123 or an equivalent two quarters of a full one year course in general or college chemistry.

164 SURVEY OF ORGANIC CHEMISTRY LABORATORY 2 (0-4) prereq or coreq 211-212-213.

211-212-213 ORGANIC CHEMISTRY 3 (4-0) prereq 102 or 122. Credit not allowed for both Chem 160 and 211.

214-215-216 ORGANIC CHEMISTRY LABORATORY 2 (0-4) prereq or coreq 211-212-213.

245 QUANTITATIVE ANALYSIS 3 (3-0) prereq 123. Gravimetric, volumetric, colorimetric and electrometric methods of analysis; theory of error as applied to chemical analysis; introduction to analytical separation.

246 QUANTITATIVE ANALYSIS LABORATORY 2 (1-6) prereq or coreq 245.

264-265-266 ORGANIC CHEMISTRY 3 (4-0) prereq 123. Designed for chemistry majors.

267-268-269 ORGANIC CHEMISTRY LABORATORY 2 (0-6) prereq or coreq 264-265-266.

290 PROBLEMS AND RESEARCH V R-10 prereq c/l.

FOR UNDERGRADUATES AND GRADUATES

320 METHODS OF TEACHING HIGH SCHOOL CHEMISTRY 3 (2-4) prereq 123 or 226. Designed to familiarize prospective high school chemistry teachers with texts, demonstrations and laboratory experiments used in newer approaches to teaching of high school chemistry (CBA and CHEMS). Credit not allowed toward bachelor's degree in chemistry.

341-342-343 INSTRUMENTAL METHODS AND PHYSICAL MEASUREMENTS 3,2,2, (1,6) (0,6) prereq 245 or equiv., Chem. 271, or c/l.

370 SURVEY OF PHYSICAL CHEMISTRY 4 (4-0) prereq 102 or 122, and 15 credits of college physics. Those portions of physical chemistry which are of special interest to prospective students of medicine.


376 SURVEY OF PHYSICAL CHEMISTRY LABORATORY 1 (0-4) prereq or coreq 370.

381 (384) PHYSIOLOGICAL CHEMISTRY 3 (3-0) prereq 160, 212 or 265. Chemistry and metabolism of proteins, lipids and carbohydrates; respiration; colloids.

385 CLINICAL CHEMISTRY LABORATORY 2 (1-3) prereq or coreq 361 or 462. Analysis of biological fluids and tissues. Factors involved in the evaluation of the clinical status of the patient. Recommended for students in pharmacy, medical technology and dietetics.

390 (391) CHEMISTRY OF PLANT CONSTITUENTS V 3 or 4 (3-0 or 4) prereq 160 or = . Chemistry and analysis of plant components, including sugars, glycosides, polysaccharides, lignin and extractives. (Same as Bot. 390 and For. 390).

391 (392) CHEMISTRY OF WOOD PRODUCTS 3 (3-0) prereq 361. The chemistry of pulp, paper, cellulose derivatives, naval stores, industrial polymers, flame retardants, modified woods, and other wood products. (Same as For. 391).

431-432-433 SEMINAR I (0-2)-R 6 prereq 213 or 266, and a reading knowledge of German. Presentation and discussion of current literature of chemistry. Use of the library.

448 ADVANCED INSTRUMENTAL METHODS AND PHYSICAL MEASUREMENTS 5 (0-6) prereq 371 and 372.

452 PHYSICAL INORGANIC CHEMISTRY 3 (3-0) prereq 123, 213 or 266, 371 or 370.

453 CHEMISTRY OF THE REPRESENTATIVE ELEMENTS 3 (3-0) prereq 452.

455 INORGANIC CHEMISTRY LABORATORY 2 (0-6) prereq 123, 213 or 266 and c/l.

461 CARBOHYDRATES 3 (3-0) prereq 213 or 266, 361. Structure, reactions, derivatives and biological aspects of carbohydrate compounds.

463-464 THEORETICAL ORGANIC CHEMISTRY 3 (4-0) prereq 213.

486 ORGANIC QUALITATIVE ANALYSIS V 3-3-3 (2-4 to 8) prereq 213 or 266. Systematic methods of identification of pure organic compounds and mixtures; general class reactions of organic chemistry.

474 INTRODUCTION TO MOLECULAR STRUCTURE 3 (3-0) prereq Math 252 or 253 and Physics 222. Quantum mechanical description of atoms and molecules. Statistical mechanics.

478 RADIOCHEMISTRY 3 (2-4) prereq 102 or 122. The principles of nuclear reactions, interactions of high energy photons and particles with matter and the instruments used in observing them; the chemical effects of radiation and the application of nuclear reactions to chemical problems.

481-482 ELEMENTARY BIOCHEMISTRY 3 (3-0) prereq 212 or 265. Primarily for science majors.

485-486 BIOCHEMISTRY LABORATORY 2 (1-3) prereq or coreq 481-482. Primarily for science majors planning to do laboratory research.

490 PROBLEMS AND RESEARCH V R-10 prereq c/l.
471-472-473 NUMERICAL ANALYSIS 4 (3-4) prereq Math 253 and CS 201 for CS 471; c/w for 472 and 473. Error analysis, 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.)

475 COMPUTER SIMULATION OF BUSINESS SYSTEMS 3 prereq BA 350 or equivalent and CS 301 or equivalent. Modeling business information and control systems for simulation on electronic computers. Applications in inventory control, planning, forecasting and budgeting. (Credit not allowed for this course and BA 475)

476-477-478 COMPUTER METHODS OF SOLUTION OF LINEAR SYSTEMS 3 (3-2) prereq Math 353 and CS 301 and c/w. Necessary material from linear algebra and matrix theory. Error analysis of algorithms currently used in the solution of linear simultaneous equations and in obtaining eigenvalues. Each student will complete at least one computer program. Applications to linear programming.

469 SEMINAR V R-6 Guidance in special work.

FOR GRADUATES

554 ARTIFICIAL INTELLIGENCE V R-4 prereq CS 473 or Math 473. Theorem proving by computers, heuristics and algorithms and their implementation by computers.

DRAMA

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 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 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: 1. Drama 101, 121-122-123, 131-132-133, 151, 199, 201, 202-203, 244, 251, 301, 302-303, 311, 499 (4 cr.), plus a minimum of 12 credits in Drama. Drama majors are required to enroll in Drama 200 or 300, Drama Workshop, for three years, but need not enroll for credit. The following courses outside the drama department are required: English 150, 202 or 450, and 345.

HPER 100 (Ballet, Modern Dance, or Fencing) is strongly recommended.

A Foreign Language (especially French) is recommended for the Bachelor of Arts degree.

The nature of Drama strongly suggests that Drama majors take a wide variety of University courses during their college careers. A list of recommended courses is available at the Department office. Students are urged to consult with the Department faculty before selecting these courses.

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 the Bachelor of Arts degree except that the aggregate number of credits in the Department of Drama must be a minimum of 64 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 teaching certification with a teaching major or minor in Drama are listed under Education.

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

Freshman Year

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<tr>
<th>Quarter</th>
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<tbody>
<tr>
<td>Drama 101</td>
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<tr>
<td>Drama 121-122-123</td>
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<td>3</td>
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<tr>
<td>Drama 131-132-133</td>
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<tr>
<td>Drama 200</td>
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<tr>
<td>Drama 251</td>
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<tr>
<td>English 100</td>
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<tr>
<td>Non-Drama Electives or Language</td>
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<tr>
<td>HPER 100 (Ballet, Modern Dance or Fencing)</td>
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Sophomore Year

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<tr>
<td>Drama 200</td>
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<tr>
<td>Drama 301, 302, 303</td>
<td>2</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Drama 344</td>
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<tr>
<td>English 202 or 450</td>
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<td>Non-Drama Electives or Language</td>
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<tr>
<td>Electives</td>
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Junior Year

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<tbody>
<tr>
<td>Drama 300</td>
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<tr>
<td>Drama 301, 302, 303</td>
<td>3</td>
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<tr>
<td>Drama 411</td>
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<td>English 343</td>
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<td>Electives</td>
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Senior Year

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<th>Quarter</th>
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<tr>
<td>Drama 499</td>
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<tr>
<td>Electives</td>
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<td>2</td>
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<tr>
<td>*B.A. degree candidates are not required to enroll in these courses for credit. *B.F.A. candidates check current departmental requirements for electives in area of emphasis.</td>
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</table>

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 (101) REHEARSAL AND PERFORMANCE I R-6. Enter any quarter. Prereq c/l. Students engaged in any aspect of production including acting, directing, lighting, stagccraft, makeup, costumes, properties, business and publicity, are eligible for registration.

101 (112) INTRODUCTION TO THE THEATER 3. The elements which make up the art of play production. The principles underlying all the arts.

121-122-123 (121) ELEMENTARY ACTING 3. Pantomime, movement, stage voice.

131-132-133 (131) STAGECRAFT 4 (3-3). Enter any quarter. The physical theater, scenery, construction, painting, rigging, stage properties and fundamentals of lighting and costuming.

200 BEGINNING THEATER WORKSHOP V 0-4 R-12. Laboratory production in all the arts of the theater.

201-202-203 (261-262-263) DRAMATIC LITERATURE 3. Enter any quarter. Emphasis upon the performed play, from the Greeks through contemporary theater.

221-222-223 INTERMEDIATE ACTING 3 prereq 121-122-123, 251 or c/l. Characterization and scene work. Additional work in voice and pantomime.

224 (251) STAGE MAKE-UP 2. Principles of and practice in theatrical make-up. Students will work on make-up for major productions.


FOR UNDERGRADUATES AND GRADUATES

300 (394) WORKSHOP IN THEATER V 2-10 R-20 prereq previous work in theater or drama courses. Advanced laboratory production in all the arts of the theater.


300 PLAYWRITING 2 R-6 prereq c/l. Techniques and practice in writing short and full length plays.

307-308-309 THE DRAMA (see English)

511-512-513 (223-422) DIRECTING 4 prereq 8 credits in drama. Directing the play. (311) Basic techniques. (312-313) Types and styles of production. Assignments in conjunction with the Theater and Opera Workshops.
ECONOMICS is that branch of the social sciences which deals with man's efforts to satisfy his wants by utilizing the scarce material provided by nature. The department considers its teaching goals to be threefold: (1) To present to students the basic theoretical tools of economic analysis, relevant facts and institutional material, which will assist them as civic leaders. (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, mathematical economics, monetary theory, international economics, public finance, labor economics, regional economics, comparative economic systems, and econometrics.

Students may major in economics leading to a Bachelor of Arts or Bachelor of Science degree or a minor in economics and political science. Graduate work leading to a Master of Arts degree with a major in economics is given.

ECONOMICS

251-252-253 (351) ADVANCED ACTING 3 prereq 221-222-223 or c/l. Advanced scene work. Historic and contemporary styles of acting.

255 (324) FOUNDATIONS FOR TELEVISION 3 prereq 121. Theory and practice of acting before the television camera.

331 (332) ADVANCED STAGECRAFT 3 R. Advanced studies and practice in scenery construction and painting, properties, sound, lighting, costuming and related areas.

333-334 SCENIC DRAFTING 2. Drafting techniques for the scene designer and tech director.

401-402-403 (343) STAGE LIGHTING 3 prereq 123. Theatrical lighting, instruments and practice. Students will work on lighting for major productions.


371 (321) THEATER PRODUCTION IN THE HIGH SCHOOL 3. Problems of high school theater including play selection, staging, action, production, organization. (Not for drama majors.)

374 CHILDREN'S THEATER 3 prereq c/l. History and objectives of the theater for the child audience. Techniques of acting, directing, and producing plays for children.

377 (389) CREATIVE DRAMATICS 3 prereq c/l. Creative play, improvisation, and child-centered literature in dramatic form as a teaching method for non-theater subjects at the elementary school level.

381 ART HISTORY OF THE THEATER 2. Visual arts of the theater as an important aspect of the aesthetic theories developed in selected periods of history.

400 TOURING 2-10 R-20 prereq consent of department chair. Laboratory experience in total play production through participation in state, regional, national and international touring production programs.

431-432-433 SCENE DESIGN 3. Principles of stage design and the relation of the setting to the play, including principles of design, rendering, drafting and period decor.

435 (443) ADVANCED STAGE LIGHTING 3 prereq 335-336. Lighting for the theater and related forms, with special attention to control and equipment, scenery projection, various forms of staging, and lighting design. Students will light productions.

439 SOUND IN THE THEATER 2. Principles, practice and equipment used to create sound and music effects for the theater.

444 (441) ADVANCED MAKE-UP 2 prereq 244 or experience and c/l. Characterization, prosthesis, masks and special effects. Student will work on makeup for plays.

491-492-493 (401-402-403) THEATER PROJECTS V 2-4 R prereq 10 credits in drama and c/l based on equivalent. Independent study in all the arts of the theater.

499 (491) SEMINAR 2-6 prereq 10 credits in drama courses or in English 201-202-203, 341-342-343 and c/l. Seminar in advanced creative dramatic theory relating to acting, directing, design, and dramaturgy.

FOR GRADUATES

501 STUDIES IN DRAMATIC LITERATURE 2-6 Concentrated study of a playwright, style or movement.

506 (541) ADVANCED PLAYWRITING V 2-4 R prereq 306. Creative work of the student's choice. Structure, characterization, dialogue as used in the play form.

511 (522) SPECIAL PROBLEMS IN DIRECTION 2-4 R prereq 312. Special directing problems involved in areas such as musical and opera production, pre-modern drama, etc. Individual directing projects.

515 (521) THEATER ADMINISTRATION 3 prereq c/l. Administrative and organizational techniques in the operation of theater producing organizations.

531 (511) TECHNICAL DIRECTION V 2-4 R prereq strong technical background such as purchase and installation of budget, staff, construction, rehearsals, and performances. Student may serve as technical director for a production.

571 (531) SEMINAR IN HIGH SCHOOL THEATER PRODUCTION 2 prereq 381. Intensive study of play production in the secondary schools with particular emphasis upon direction and training of high school students.

699 THESIS V 2-5 R-15

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, 50 credits in economics must be earned. Within the 50 credits in economics the student must include an introductory economics sequence, Economics 311-312-313, before the senior year, and 4 credits in economics courses numbered 400 or above. As a requirement for the major and as a prerequisite for other economics courses, the introductory economics sequence may be fulfilled by any one of the following options: (1) Economics 111-112-113; (2) Economics 211-212-213; (3) Economics 111-211-212. The following courses may be counted as part of the 50 economics credits required for the undergraduate degree: Economies 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360.

SPECIAL REQUIREMENTS FOR THE GRADUATE DEGREE: In addition to the requirements listed above, the student shall have completed 60 credits in economics, monetary theory, international economics, public finance, and any student planning graduate study in economics must take Mathematics 151-152-153, and at least one additional economics course numbered 350-359.

SPECIAL REQUIREMENTS FOR THE GRADUATE DEGREE: In addition to the requirements listed above, the student shall have completed 60 credits in economics, monetary theory, international economics, public finance, and any student planning graduate study in economics must take Mathematics 151-152-153, and at least one additional economics course numbered 350-359.

GRADUATE WORK: See Graduate School.

FOR UNDERGRADUATES

For explanation see Course Description (Index)

111 INTRODUCTION TO POLITICAL ECONOMY 4. A critical examination of the market mechanism as a social decision device to guide the use of a nation's resources. The limitations of these processes in the light of current economic problems such as the rise of the large corporation, monopoly, environmental degradation, economic discrimination, and the increasing role of the government.

112 PROBLEMS IN POLITICAL ECONOMY 4 prereq 111. An analysis of current economic problems including problems of unemployment, government, inflation, economic growth, and America's relationship with underdeveloped nations.

211 (322) INTRODUCTION TO ECONOMIC THEORY I 3. Nature of the American economy, markets, value and price determination.
212 (201) INTRODUCTION TO ECONOMIC THEORY II 3 preq 211. National income determination, money and its use, economic instability.

213 (203) INTRODUCTION TO ECONOMIC THEORY III 3 preq 212. Distribution of income; selected economic topics.

FOR UNDERGRADUATES AND GRADUATES

301 MONEY AND BANKING 4, Su 3, preq an introductory economics sequence. Money, banking, and the federal reserve system as a regulator of money; monetary theories, history, and policy.

304 PUBLIC FINANCE 4, Su 3, preq an introductory economics sequence. Principles and problems of governmental expenditures and revenues.

305 STATE AND LOCAL TAXATION 3 preq 304. Revenues and expenditures on state and local levels.

311 INTERMEDIATE ECONOMIC ANALYSIS I 4, Su 3, preq 106 or equivalent. Theory of the firm.

312 INTERMEDIATE ECONOMIC ANALYSIS II 4, Su 3, preq 111. Input analysis and welfare conditions.

313 INTERMEDIATE ECONOMIC ANALYSIS III 4, Su 3, preq 106 or equivalent. Macroeconomic analysis.

315 DEVELOPMENT OF ECONOMIC THEORY I 4, Su 3, preq an introductory economics sequence. Economic ideas from early times to 1690.

316 DEVELOPMENT OF ECONOMIC THEORY II 2 preq an introductory economics sequence. Economic theories from 1890 to the present.

321 LABOR ECONOMICS I 3 preq an introductory economics sequence. Institutional legal background of labor markets.

322 LABOR ECONOMICS II 3 preq 321. Economics of labor markets.

324 INDUSTRIAL RELATIONS 3 preq 321. Problems and public policy in labor-management relations.

331 INTERNATIONAL ECONOMICS I 3 preq 331. Pure theory of international trade.

332 INTERNATIONAL ECONOMICS II 3 preq 331. International monetary relations and foreign trade.

336 INTERNATIONAL ECONOMIC RELATIONS 3 preq 112 or 212 or c/i. International economic institutions, including the International Monetary Fund, common markets, trade and commodity agreements, and foreign trade and investment.

345 ECONOMIC DEVELOPMENT 4, Su 3, preq 112 or 212 or c/i. Determinants of economic growth in poor and rich countries.

372 REGIONAL ECONOMICS I 4 preq 311. Micro-regional economics, including location theory.

373 REGIONAL ECONOMICS II 4 preq 372. Macro-regional economics, including regional development.

374 COMPARATIVE ECONOMIC SYSTEMS 4, Su 3, preq an introductory economics sequence. Capitalism, fascism, socialism, communism; evaluation.

375 THE RUSSIAN ECONOMY 4, Su 3, preq. an introductory economics sequence.

383 MONOPOLY AND COMPETITION 3 preq an introductory economics sequence. Theories of imperfect markets and workable competition models.

385 LAND ECONOMICS 3 preq an introductory economics sequence. Economic and physical characteristics of land and the institutional background of real property; classifications of properties and markets analysis; cyclical market fluctuation; impact of supply and demand; city growth, structure and planning; land use control, and real estate investment analysis.

396 (308) PUBLIC EXPENDITURE POLICY 3 preq 304 and 311. Economic analysis, programs of the federal government, and use of planning-programming-budgeting-systems, benefit-cost analysis and its relation to the theory of welfare economics, case studies in benefit-cost analysis.

406 MONETARY THEORY 4 preq 301.

411 ADVANCED MICROECONOMICS 4 preq 25 credits in economics including 311 and 312, and Math 106 or 152. Price, welfare, and general equilibrium theory at a level above intermediate analysis.

412 ADVANCED MACROECONOMICS 4 preq 25 credits in economics including 311 and 312, Math 106 or 152. Constrained maximization, maximization over time.

415 MATHEMATICAL ECONOMICS I 4 preq 311 and Math 108 or 152. Constrained maximization, maximization over time.

451 MATHEMATICAL ECONOMICS I I 4 preq 451. Input-output analysis, general equilibrium and programming, utility theory, and game theory models.

460 ECONOMETRICS I 4 preq Math 106 or 152. General linear regression models.

461 ECONOMETRICS II 4 preq 460. Econometric theory and multiple equation models.

490 ADVANCED PROBLEMS V 1-2 R-6 preq 12 credits in economics and c/i.

495 SEMINAR IN ECONOMICS V 1-3 R-12 preq c/i.

FOR GRADUATES

501 GRADUATE RESEARCH V R-6.

510-511-512 ECONOMICS 3. Elements of analytical economics: the American economy, characteristics, performance; macro-economic theory and bankings, monetary and fiscal policy; growth and stabilization; markets, pricing of outputs and inputs, government regulation; distribution and economic policy; 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, curriculum coordinator, reading specialist, and research director; or build up their backgrounds in the field or fields in 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.

ADMISSION TO TEACHER EDUCATION. Students preparing to teach in the elementary grades should major in Education; those preparing for teaching particular subjects, either in junior or senior high schools, major in the principal subject to be taught or in Education. All who plan on teaching should file a Declaration of Intent with the School of Education office at the earliest opportunity and receive assistance in planning a program of study 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, and obtain an adviser in the School of Education. To be admitted to teacher education, a student must have a grade-point average of 2.00 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) have 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 ½ 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.

KEEP IT BRIGHT
SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN EDUCATION:

Preparation for Teaching in the Secondary Grades: Candidates must earn a minimum of 40 credits in Education, including Education 100, 201, 202, 205, 305, 405 (10 credits), 407, 408, and at least one course in each of the following areas: (a) educational sociology or history or philosophy of education; (b) audiovisual, multi-media, or library service; (c) counseling, guidance, remedial or special education; and (d) special methods in a major teaching field. Students wishing to qualify for certification in a major teaching field must earn 45 or more credits in a major teaching field and 30 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.

CURRICULUM IN SECONDARY EDUCATION
Freshman and Sophomore Years

Course in Composition, Communication or Writing (e.g., Eng. 100, SC 110, SC 234, For. 220, Jour. 150) .................................................................................................................. Cr. 3-5
Courses in Major and/or Minor Teaching Fields ................................................................................................................................. 35-50
Edu. 290, Orientation to Education ................................................................................................................. 2
Edu. 205, Educational Psychology ......................................................................................................................... 4-43
Electives ............................................................................................................................................................................................. 90-105

Junior and Senior Years

A course in Advanced Composition or Communication (e.g., Eng. 360, Eng. 371, Eng. 450, SC 353, SC 385) ......................... 3
Edu. 402, Educational Measurement and Research .................................................................................. 3
Edu. Required Courses from Options Allowed .................................................................................. 12
Edu. 405, Survey of Educational Standards and Trends ........................................................................... 4
Edu. 405, Student Teaching: Secondary ........................................................................................................ 10
Edu. 407, Problems in Teaching ......................................................................................................................... 3
Electives and/or Courses in Major and/or Minor Teaching Fields .......................................................... 33-68
............................................................................................................................................................................................. 90-105

Preparation for Teaching in the Elementary Grades. Candidates must earn a minimum of 43 credits in Education including the following required courses totaling 43 credits: Education 200, 202, 205, 309, 310, 311, 312, 340, 404, 407.

In addition, the student will complete work in the following areas: English, 21 credits including 8 credits in English composition; Social Studies, 20 credits; Science, 18 credits; Mathematics, 9 credits; Health, Physical Education and Recreation, 6 credits; Art, 6 credits; and Music, 6-8 credits.

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 Language, Health, Physical Education and Recreation, Library Science, Special Education. Approved minor patterns are available at the School of Education office.

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

CURRICULUM IN ELEMENTARY EDUCATION
Freshman and Sophomore Years

Courses in Composition, Communication or Writing (e.g., Eng. 100, SC 110, SC 234, For. 220, Jour. 150) .................................................................................................................. 6
SC 118, Oral Expression ................................................................................................................................. 3
LA 151-2-3, Introduction to Humanities ........................................................................................................ 6
Geog. 101, Physical Elements of Geography ................................................................................................. 5
Mus. 223-3-4, Music Education in the Elementary Schools ........................................................................ 5
Edu. 290, Orientation to Education ......................................................................................................................... 2
Edu. 201, Education Laboratory ......................................................................................................................... 2-6
Edu. 202, The Elementary School Child ......................................................................................................................... 2
HPER 199, First Aid ..................................................................................................................................................... 2
Hist. 261-2, United States History ......................................................................................................................... 2
Math 250, Theory of Arithmetic ......................................................................................................................... 2
Math 290, Intuitive Geometry (or an elective course in Math) .................................................................... 2
Pol. Sci. 101, American Government ......................................................................................................................... 4
Social Science Courses ........................................................................................................................................... 10
Electives ............................................................................................................................................................................................. 101-105

Junior and Senior Years

Edu. 340, Survey of Children's Literature ......................................................................................................................... 3
Edu. 306, Teaching Elementary School Reading ............................................................................................... 3
Edu. 310, Teaching Elementary School Mathematics ............................................................................................... 3
Edu. 310, Teaching Elementary School Social Studies ............................................................................................... 3
Edu. 311, Teaching Elementary School Science ........................................................................................................ 3
Edu. 312, Teaching Elementary School Language Arts ............................................................................................... 3
A Course in Advanced Composition or Communication (e.g., Eng. 360, Eng. 371, Eng. 450, SC 353, SC 385) ............... 3
Art 313-14, Elementary School Art ......................................................................................................................... 6
Edu. 344, Conservation of Natural and Human Resources in Montana .................................................................................. 3
HPER 326, Teaching Physical Education in Elementary School ........................................................................... 3
HPER 326, The School Health Program ......................................................................................................................... 3
Edu. 404, Student Teaching: Elementary ......................................................................................................................... 15
Edu. 407, Problems in Teaching ................................................................................................................................. 4
Electives ............................................................................................................................................................................................. 90-94

RECOMMENDATIONS FOR MONTANA TEACHING CERTIFICATES.
The University of Montana grants to its graduates who meet state certification requirements to the State Department of Public Instruction an approved institution of higher education. Students who expect to teach in elementary education should investigate specific requirements because they differ in various schools.

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

1. A bachelor's degree from the University of Montana or other approved institution of higher education showing that 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 must complete a four-year approved program of study in the appropriate teaching field. The Northwest Association of Secondary Schools encourages 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.

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

Sophomore year: Edu. 200, 2 credits.

Junior year: Edu. 205, 4 credits.

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

SEQUENCE OF CERTIFICATION COURSES IN ELEMENTARY EDUCATION FOR PROFESSIONAL CERTIFICATION.
The Montana professional certificate is issued to applicants having 3 or more years successful teaching experience who have completed a major and/or minor teaching field beyond the bachelor's degree. Students intending to qualify for this certificate and the program of study in the major teaching field should consult the library service instructor for advice on additional courses.

PREPARATION FOR PROFESSIONAL CERTIFICATION.
The University of Montana recommends its graduates who expect to be certified to teach in the secondary grades complete a four-year approved program of study in the appropriate teaching field. The Northwest Association of Secondary Schools encourages 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.

PREPARATION FOR SCHOOL LIBRARIANS.
The library service librarian train school and school-librarians to meet the requirements of the Northwest Association of Secondary Schools. The Elementary School Library level is based solely upon the Bachelor's Degree in Elementary Education.

GRADUATE WORK. See Graduate School Bulletin.

FOR UNDERGRADUATES

FOR EXPLANATION SEE COURSE DESCRIPTIONS (INDEX)

123-125-127 SCIENCE FOR ELEMENTARY TEACHERS 5 (4-2)
Open only to majors in Elementary Education. (123) A survey of the fundamental physical sciences, including force and motion, electricity, magnetism, wave motion, gravity, heat, states of matter, the universe, geological processes, atomic structure, and related topics. (125) An introduction to the interrelationships of physical science and biological sciences: the elements, chemical reactions, basic organic chemistry, biochemistry, metabolism, cell structure, relationships 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 anatomy, physiology, psychology, life cycles, ecology, evolution, and related topics.


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

202 THE ELEMENTARY SCHOOL CHILD 5 prereq 200, coreq 203. 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.
302-303 METHODS OF TEACHING PHYSICAL EDUCATION ON THE SECONDARY LEVEL. (See Health, Physical Education and Recreation.)

305 SECONDARY SCHOOL TEACHING PROCEDURES 5 prereq 200 and 205.

308 TEACHING ELEMENTARY SCHOOL READING 3 prereq 202.

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

310 TEACHING ELEMENTARY SCHOOL SOCIAL STUDIES 3 prereq 202.

312 TEACHING ELEMENTARY SCHOOL LANGUAGE ARTS 3 prereq 202.

322-324-325 SCHOOL MUSIC. (See Music.)

339 TEACHING PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS. (See Health, Physical Education and Recreation.)

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

402 OBSERVATION AND PARTICIPATION: ELEMENTARY V R-6 prereq or coreq an elementary methods of teaching course and c/i.

403 OBSERVATION AND PARTICIPATION: SECONDARY V R-6 prereq or coreq 205 or =.

404 STUDENT TEACHING: ELEMENTARY V R-15 prereq 200, 202 and consent of Director of Student Teaching.

405 STUDENT TEACHING: SECONDARY V R-10 prereq 200, 205 and consent of Director of Student Teaching.

407 PROBLEMS IN TEACHING 3 prereq c/i. Current problems and issues in teaching.

FOR UNDERGRADUATES AND GRADUATES

304 CONSERVATION OF NATURAL AND HUMAN RESOURCES IN MONTANA 3 prereq c/i. A critical survey of climate, physiography, mineral resources, soil and water, as related to plant and animal production and human welfare, and the development of principles underlying improved management of the natural resources. A survey of 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.

306 METHODS OF TEACHING EARTH SCIENCE. (See Geology.)

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

313-314 ELEMENTARY SCHOOL ART. (See Art.)

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

322 METHODS OF TEACHING BIOLOGY 3 (3-4) 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.

326 TEACHING OF ENVIRONMENTAL EDUCATION (K-12) 3 prereq Educ 304 and c/i.

327 PROBLEMS IN ENVIRONMENTAL EDUCATION 3 prereq c/i. Designs, 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 REDIEMAL 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. Methods and materials for specialists, classroom teachers, and administrators who wish to initiate remedial programs.

341 ADMINISTRATION OF THE SMALL PUBLIC AND COLLEGE LIBRARY 4 prereq c/i. Objectives of library service, library routines and procedures, library buildings and equipment, the library's 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 instruction and production of sound and visual media; development of programmed learning and other special techniques in instructional design.

360 EDUCATIONAL SOCIOLOGY 3. Education in modern social, economic, and political life; the school as a social institution; 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 American 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. (See Business Administration.)

382 METHODS OF TEACHING ENGLISH (See English.)

384 METHODS OF TEACHING SHORTHAND AND TRANSCRIPTION. (See Business Administration.)

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.)

406 INTERNSHIP IN SPECIAL EDUCATION V R-15 c/i.

411 SUPERVISION AND TEACHING OF THE LANGUAGE ARTS. (See English.)

413 METHODS OF TEACHING OF THE LANGUAGE ARTS 3 prereq teaching experience and c/i. Analysis of current methods in the teaching of language 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. Curriculum trends, instructional materials, research, and supervisory techniques relevant to modern elementary school social studies program.

418 SUPERVISION AND TEACHING OF SCIENCE IN THE ELEMENTARY SCHOOL 3 prereq 125-129-127 or =, teaching experience and c/i. Curriculum trends, instructional materials, testing, reading in the content fields, research, and developments.

420 METHODS OF TEACHING SECONDARY SCIENCE 3 prereq 205, a science minor and c/i.

421 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 3/4 of the major or minor teaching field in mathematics.

424 METHODS OF TEACHING COMMUNICATION SKILLS. (See Speech Communication.)


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 safety education.

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

428 METHODS OF TEACHING SOCIAL STUDIES IN SECONDARY SCHOOLS 3 prereq 205 or teaching experience.

429 THE SLOW AND RETARDED LEARNERS 3 prereq 12 credits in Education. Needs, traits, identification, curriculum, teaching methods, and research.
32—EDUCATION

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

434 REMEDIAL READING LABORATORY 3 R-9 prereq or co­req 334 and c/i. Supervised practice in diagnosis and remedial instruction.

435 INTRODUCTION TO MENTAL RETARDATION 3, prereq 202 or consent of instructor. Historical, psychological, social, and educational aspects of mental retardation.

436 CURRICULUM FOR THE MENTALLY RETARDED 3, prereq 431 or 435 and c/i. Planning, development, and use of curriculum materials designed for the mentally retarded.

437 PRECISION TEACHING AND BEHAVIOR MODIFICATION IN THE SPECIAL CLASSROOM 3 prereq 431 or 435. Learning theory approach to the analysis and evaluation of academic and para­academia behavior in the classroom.

438 ADMINISTRATION OF THE INTERMEDIATE SCHOOL 3 prereq 205 or teaching experience. Objectives, organization, class scheduling, and co-curricular activities in middle schools or junior highs schools.

440 LIBRARY PROGRAMS IN ELEMENTARY SCHOOLS 3 prereq a course in children's literature. Functions and use of classroom collections and centralized libraries for curriculum enrichment experiences, reading, guidance, and teaching library skills. Responsibility for classification, elementary librarians, library supervisors, elementary principals and administrators.

441 EVALUATION OF SCHOOL LIBRARY SERVICES AND MATERIALS 2 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 children's literature. 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 librarianship. General 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. Graphic techniques in the areas of lettering, coloring, enlarging, mounting, and production in the preparation of media for projected and non-projected use.

448 UTILIZATION OF AUDIOVISUAL MEDIA 3 prereq 347. Selection 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 coordination of the audiovisual communication program and distribution of educational media for elementary or secondary school programs.

450 SECONDARY SCHOOL GUIDANCE 4 prereq 205 and c/i. Orientation to the need, organization, and methodology of guidance services in the secondary schools.

451 GUIDANCE IN THE ELEMENTARY SCHOOL 4 prereq 202 and c/i. 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 and the need for remedial 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 1800; (462) 1800 to present.

464 PHILOSOPHY OF EDUCATION 3 prereq c/i. Leading philosophical points of view in Education, concepts of the individual, society, the educative process, and the role of education.

469 INDEPENDENT STUDY V R-10 prereq c/i.

490 SEMINAR V R prereq c/i. Group analysis of problems in specific areas of education.

FOR GRADUATES

505 INTERNSHIP V R-15 prereq c/i. Supervised field experience in administration, counseling, special education or curriculum. (Admission by application only.)

550 CURRICULUM FOUNDATIONS 4 prereq c/i. An analysis of the base of curriculum in the light of historical perspective, value systems, current curriculum patterns, educational objectives, and research in growth and development.

551 ELEMENTARY CURRICULUM 4 prereq 550 or c/i. Major trends in course content, grade placement, organization of materials, and evaluation of outcomes.

532 HIGH SCHOOL CURRICULUM 4 prereq 530 or c/i. Sociological, psychological, and philosophical foundations of the high school curriculum, and its role in the separate subjects and organizing for curriculum development.

533 INTERMEDIATE SCHOOL CURRICULUM 4 prereq 530 or c/i. Sociological, psychological, and philosophical foundations of the junior high schools and middle schools. Curriculum trends in the separate subject area, organization and administration for the implementation of the curriculum.

534 CURRICULUM ISSUES 3 prereq c/i. Current issues in curriculum at all levels of education pertaining to planning, developing, implementing, and evaluating.

535 CURRICULUM WORKSHOP V R-10 prereq teaching experience and c/i.

550 ADVANCED EDUCATIONAL PSYCHOLOGY 3. General behavior and learning; motivation, interference reduction, reinforcement, teaching for permanence and transfer. Current research in field.

551 ADVANCED CHILD DEVELOPMENT 3 prereq c/i. Physical, intellectual, social, emotional growth from birth to age 12 with special reference to the writings of Freud, Gesell, and others.

552 INDIVIDUAL APPRAISAL IN COUNSELING AND GUIDANCE 3 prereq 450 or 451, and 452. Collecting and interpreting data concerning the individual use of such data in counseling.

553 GROUP COUNSELING AND GUIDANCE PROCEDURES 5 R-10 prereq 450 or 451 and a course in abnormal psychology or personality dynamics. Group processes, interaction and prac­ticum experience.

554 OCCUPATIONAL INFORMATION 3 prereq 450 or c/i. Sociological, economic, and psychological factors in occupational selection, classification, filing system, evaluation, selection, and use of occupational information.

555 THEORIES OF COUNSELING 3 prereq 450 or 451 and a course in abnormal psychology or personality dynamics. Conceptual approaches to counseling.

556 INDIVIDUAL COUNSELING PRACTICUM 5 prereq c/i.

557 ORGANIZATION AND ADMINISTRATION OF PERSONNEL SERVICES 3 prereq c/i. The development and organization of guidance services in the school with emphasis on philosophy, organization procedures and facility involvement.

558 SEMINAR IN COUNSELING AND GUIDANCE 3 prereq c/i. Current literature and research in the counseling and guidance field.

559 ADVANCED COUNSELING PRACTICUM R-10, prereq an introductory counseling practicum and c/i.

561 COMPARATIVE EDUCATION 3. A comparison of the edu­cation systems of United Kingdom, France, Germany, Italy, the Soviet Union, Japan and the United States.

565 THE GREAT EDUCATIONAL DOCUMENTS 3 prereq c/i. The writings of leading educational thinkers, ancient and modern, including Plato, Aristotle, Quintillian, Bacon, Pestalozzi, Herbert, Spencer, and John Dewey.

568 SOCIOCOLOGICAL FOUNDATIONS OF AMERICAN EDUCATION 3 prereq c/i. The background of education in its broadest sense as found in the religions, the economic system, the family, the estate, and other social institutions.

569 SCHOOL AND COMMUNITY 3 prereq c/i. Community resources which may be utilized for the enrichment of the educational program.

570 EDUCATIONAL ADMINISTRATION 4 prereq teaching experience. Administrative relationships at federal, state, and local levels; responsibilities of school superintendents.

571 ADMINISTRATIVE BEHAVIOR 3, prereq teaching experience or c/i.

572 ELEMENTARY SCHOOL ADMINISTRATION 3 prereq teaching experience.

573 SECONDARY SCHOOL ADMINISTRATION 3 prereq teaching experience.

574 SCHOOL SURVEYS AND STUDIES 3 prereq 570. Techniques and organization of the study of future needs and direction of education in the local school district.

575 SCHOOL SUPERVISION 4 prereq teaching experience. Roles and responsibilities of assigned leaders for improving instruction and promoting in-service growth of personnel.

576 SCHOOL FINANCE 4 prereq teaching experience. Sources of school revenue, community relations, legal implications, and proper expenditures; relationship of foundation programs and district reorganization.

577 SCHOOL FACILITIES PLANNING V 2-4 prereq 570 or = and c/i. Procedures for determining school facility needs and prepa­tion of educational specifications.

578 LEGAL BASIS OF PUBLIC EDUCATION 3 prereq 570 or = and c/i. Legal concepts of education in the United States; legal implications of educational policies and practices; legal problems affecting pupils, parents, teachers, administrators, and school board members in relation to the school.

579 PERSONNEL ADMINISTRATION 3 prereq 570 and c/i. Problems of certified and non-certified personnel (not students); selection, in-service training, assignment, supervision, and welfare.
591 COLLEGE TEACHING 3 preq 30 credits of graduate work. The type of teaching applicable to the college level.

592 PROBLEMS IN TEACHING BOOKKEEPING. (See Business Administration.)

593 PROBLEMS IN TEACHING SHORTHAND AND TRANSCRIPTION. (See Business Administration.)

594 PROBLEMS IN TEACHING TYPEWRITING. (See Business Administration.)

595 UNIT COURSES IN BUSINESS EDUCATION. (See Business Administration.)

596 VOCATIONAL DEVELOPMENT THEORY 3 preq 554 or c/l. A comparison of current theories of occupational development.

597 INDEPENDENT STUDY V R-10 preq consent of adviser and instructor.

598 SUPERVISION OF STUDENT TEACHING 3 preq c/l. Philosophy, procedures, and problems in supervision of student teachers. For elementary and secondary teachers who work (or intend to work) with student teachers.

599 SEMINAR V R preq c/l. Group analysis of problems in specific areas of education.

600 METHODS OF EDUCATIONAL RESEARCH 4. Research problems: their statement, organization, techniques, tabulation of materials, statistical concepts necessary for interpretation of research data. (An introductory course in statistics is highly desirable.)

601 EDUCATIONAL STATISTICS 4 preq an introductory course in statistics and c/l.

602 RESEARCH V R-15 preq c/l.

630 ADULT AND CONTINUING EDUCATION 3 preq c/l. Differences in methods used with children and adults. Psychology of adult learner and techniques for stimulating new interests and purposes.

633 CURRICULUM TRENDS IN HIGHER EDUCATION 3 preq c/l.

638 THE AMERICAN COMMUNITY/JUNIOR COLLEGE 3 preq c/l.

670 ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION 3 preq c/l.

699 THESIS OR PROFESSIONAL WRITING V R-30.

ART

*Major Field

Minor Field

(61 credits) (33 credits)

Art 123—First Year Studio 15 15
Art 125—Ceramics 6 6
Art 160—Layout and Lettering 2 2
Art 200-1-2—Survey of Western Art 9 9
Art 215—Photography 3 3
Art 227—Crafts/Design 4 4
Art 233—Printmaking 2 2
Art 235—Sculpture 6 6
Art 239—Water Color 3 3
Art 240—Painting 6 6
Art 250-Methods of Teaching Secondary Art 3 3
Art 255—Secondary School Art 3 3
*

BIOLOGICAL SCIENCE

Major Field

Minor Field

(87-93 credits) (55-54 credits)

Micro 300—General Microbiology 9 9
Bot-Zool 111—Introduction to Biology 9 9
Bot-Zool 114—General Botany 15 15
Zool 112—General Zoology 10 10
Bot-Zool 250—Basic Concepts of Ecology (or Bot 251) 5 5
Bot-Zool 485—Genetics 5 5
For-Educ 304—Conservation of Natural and Human Resources 3 3
*Chem 160 and 164—Survey of Organic Chemistry and Laboratory 5 5
Geol 101—Survey of Environmental Geology (or Phys 111-2-3) 15 15
Math 116—College Algebra 5 5
Electives—Upper Division Biology Courses 11

*Students presenting a minor field in Chemistry should substitute Chem 121-2-3-4-5-6.

**Minors may substitute Bot 265 or For-Educ 304 or Bot-Zool 250.

BUSINESS ADMINISTRATION (SECRETARIAL)

Major Field

Minor Field

(64-65 credits) (54-60 credits)

Bus Ad 180 or —Beginning Typewriting 2 2
Bus Ad 181 or —Intermediate Typewriting 2 2
Bus Ad 182 or —Advanced Typewriting 2 2
Bus Ad 183—Production Typewriting 2 2
Bus Ad 184-5-6—Stenography 15 15
Bus Ad 193—Beginning Secretarial Practice 2 2
Bus Ad 194—Records Management 2 2
Bus Ad 301—3-3—Accounting Principles 9 9
Bus Ad 292—Office Machines Practice 2 2
Bus Ad 357—Legal Environment of Business 3 3
Bus Ad 390—Electronic Information Processing 3 3
Bus Ad-Educ 380—Methods of Teaching Typewriting 2 2
Bus Ad-Educ 381—Methods of Teaching Bookkeeping & Basic Business 2 2
Bus Ad 383—Office Management 3 3
Bus Ad-Educ 384—Methods of Teaching Shorthand & Transcription 2 2
Bus Ad 385—Philosophy of Vocational Business Education 3 3
Econ 211—Introduction to Economic Theory 3 3

BUSINESS ADMINISTRATION (NON-SECRETARIAL)

Major Field

Minor Field

(54-60 credits) (46 credits)

Bus Ad 180 or —Beginning Typewriting 2 2
Bus Ad 181 or —Intermediate Typewriting 2 2
Bus Ad 182 or —Advanced Typewriting 2 2
Bus Ad 183—Production Typewriting 2 2
Bus Ad 193—Beginning Secretarial Practice 2 2
Bus Ad 194—Records Management 2 2
Bus Ad 301—3-3—Accounting Principles 9 9
Bus Ad 292—Office Machines Practice 2 2
Bus Ad-Educ 380—Methods of Teaching Typewriting 2 2
Bus Ad-Educ 381—Methods of Teaching Bookkeeping & Basic Business 2 2
Bus Ad 383—Office Management 3 3
Bus Ad 385—Philosophy of Vocational Business Education 3 3
Bus Ad 401—Income Tax 3 3
Econ 210—212—213—Introduction to Economic Theory I, II, III 9 9
Econ 301—Money and Banking 4 4

CHEMISTRY

Major Field

Minor Field

(52-54 credits) (46 credits)

Chem 121-2-3-4-5-6—College Chemistry and Laboratory 15 15
Chem 240-6—Quantitative Analysis and Laboratory 5 5
Chem 264-5 and 267-8—Organic Chemistry and Laboratory 10 10
Chem-Educ 322—Methods of Teaching High School Chemistry 3 3
Chem 452—Physical Inorganic Chemistry 3 3
Chem 451—Elementary Biochemistry 3 3
Electives—Upper Division Chemistry Courses 3 3

* prerequisite = Phys 111-2-3 (15 cr.); Math 116-7 (10 cr.)
COMMUNICATION SKILLS

<table>
<thead>
<tr>
<th>Major Field (63 credits)</th>
<th>Minor Field (37 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpCo 110—Introduction to Systems of Communication</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 112—Argumentation</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 113—Oral Expressions</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 193—Introduction to the Process of Communication</td>
<td>5</td>
</tr>
<tr>
<td>SpCo 291—Oral Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 294—Discussion and Small Groups</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 333—General Semantics</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 396—Speech Criticism</td>
<td>3</td>
</tr>
<tr>
<td>SpCo-Educ 424—Methods of Teaching Communication</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 403—Advanced Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 404—Rhetorical Theory</td>
<td>3</td>
</tr>
<tr>
<td>Eng 100—Composition</td>
<td>3</td>
</tr>
<tr>
<td>Eng 202—Introduction to Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>Eng 250—Structure of Modern English</td>
<td>3</td>
</tr>
<tr>
<td>Eng 450—Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td>Jour 270—Reporting</td>
<td>2</td>
</tr>
<tr>
<td>Jour 292—Magazine Article Writing</td>
<td>2</td>
</tr>
<tr>
<td>Jour-Educ 316—School Publications and Teaching Methods</td>
<td>3</td>
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</tbody>
</table>

*Minors may substitute SpCo 112 for SpCo 110.

COMPUTER SCIENCE

<table>
<thead>
<tr>
<th>Major Field (46 credits)</th>
<th>Minor Field (37 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 101—Introduction to Computing</td>
<td>3</td>
</tr>
<tr>
<td>CS 201—Fortran Programming</td>
<td>3</td>
</tr>
<tr>
<td>CS 202—Cobol</td>
<td>3</td>
</tr>
<tr>
<td>CS 271-2-3—Computing and Mathematics</td>
<td>9</td>
</tr>
<tr>
<td>CS 301-3-3—Intermediate Programming</td>
<td>9</td>
</tr>
<tr>
<td>CS 312—Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CS 320—Switching Theory</td>
<td>3</td>
</tr>
<tr>
<td>CS 324—Application of Digital Computers</td>
<td>4</td>
</tr>
<tr>
<td>CS 401-2-3—Advanced Programing</td>
<td>9</td>
</tr>
<tr>
<td>CS 404—Computer Applications in Education</td>
<td>1</td>
</tr>
</tbody>
</table>

*Prereq = Math 601 (9 cr.).
†Prereq = Math 116-7 (10 cr.).
‡Prereq = Math 125 (9 cr.).
§Prereq = Math 116 (5 cr.).

DRAMA

<table>
<thead>
<tr>
<th>Major Field (60 credits)</th>
<th>Minor Field (36 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr 101—Introduction to the Theater</td>
<td>3</td>
</tr>
<tr>
<td>Dr 131-3—Elementary Acting</td>
<td>9</td>
</tr>
<tr>
<td>Dr 210—Stagecraft</td>
<td>12</td>
</tr>
<tr>
<td>Dr 200—Beginning Theater Workshop</td>
<td>6</td>
</tr>
<tr>
<td>Dr 201-2-3—Dramatic Literature</td>
<td>9</td>
</tr>
<tr>
<td>Dr 244—Stage Make-Up</td>
<td>2</td>
</tr>
<tr>
<td>Dr 251—Stage Speech</td>
<td>3</td>
</tr>
<tr>
<td>Dr 303—History of the Theater</td>
<td>3</td>
</tr>
<tr>
<td>Dr 311—Directing</td>
<td>4</td>
</tr>
<tr>
<td>Dr 499—Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Electives—Any Course(s) in Drama (5)</td>
<td>5</td>
</tr>
</tbody>
</table>

*Any two quarters.

EARTH SCIENCE

<table>
<thead>
<tr>
<th>Major Field (62 credits)</th>
<th>Minor Field (36 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 101—Physical Elements of Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 350—Introductory Meteorology (or Geog 360)</td>
<td>5</td>
</tr>
<tr>
<td>Chem 101 and 104—General Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Geol 101—Introduction to Geology</td>
<td>8</td>
</tr>
<tr>
<td>Geol 104—Field Methods (or Geol 302)</td>
<td>12</td>
</tr>
<tr>
<td>Geol 206—General Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>Geol 208—Principles of Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>Geol 210—Introduction to Rocks and Minerals</td>
<td>4</td>
</tr>
<tr>
<td>Geol-Educ 306—Methods of Teaching Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>Geol 310—Geomorphology (or Geog 370)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 304—Conservation of Natural and Human Resources in Montana</td>
<td>3</td>
</tr>
<tr>
<td>Astr 131-2—Elementary Astronomy (9)</td>
<td>9</td>
</tr>
<tr>
<td>Electives—Any Courses Listed Below (4)</td>
<td>4</td>
</tr>
<tr>
<td>**Bot-Zool 299—Basic Concepts of Ecology (3 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 201—Physiol. of No. America (6 credits)</td>
<td>6</td>
</tr>
<tr>
<td>Geol 401—Advanced Physical Geography (3 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 102—Environmental Geology (4 credits)</td>
<td>4</td>
</tr>
<tr>
<td>Geol 282—Regional Historical Geology (3 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 286—World Geology (3 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 339—Structural Geology (4 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Geol 406—Intro. to Vert. Paleontology (4 credits)</td>
<td>4</td>
</tr>
<tr>
<td>Geol 440—Introduction to Geophysics (3 credits)</td>
<td>3</td>
</tr>
<tr>
<td>Phys 119—General Physics (5 credits)</td>
<td>5</td>
</tr>
</tbody>
</table>

**Prereq = Math 116-7 (10 cr.).

**Prereq = One year college biology

Prereq = Chem 100 (4 cr.)

Prereq = Phys 111, 113 (10 credits); Math 116-7-8 (15 credits)

Prereq = Phys 111 (8 credits); Math 116-7 (10 credits).

ECONOMICS

<table>
<thead>
<tr>
<th>Major Field (53 credits)</th>
<th>Minor Field (39 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 211-212—Introduction to Economic Theory I, II, III</td>
<td>9</td>
</tr>
<tr>
<td>Econ 301—Money and Banking</td>
<td>4</td>
</tr>
<tr>
<td>Econ 304—Public Finance</td>
<td>3</td>
</tr>
<tr>
<td>Econ 311-3—Intermediate Economic Analysis I, II, III</td>
<td>12</td>
</tr>
<tr>
<td>Econ 321—Labor Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 331—International Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 426—Methods of Teaching Social Economics</td>
<td>3</td>
</tr>
<tr>
<td>Studies in Secondary School Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

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

ENGLISH

<table>
<thead>
<tr>
<th>Major Field (60 credits)</th>
<th>Minor Field (30 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng 161-2-3—World Literature</td>
<td>9</td>
</tr>
<tr>
<td>Eng 200—Applied Literary Criticism</td>
<td>3</td>
</tr>
<tr>
<td>Eng 211-2-3—Introduction to Major British Writers</td>
<td>3 or 6</td>
</tr>
<tr>
<td>Eng 342—Shakespeare (or 343)</td>
<td>6 or 3</td>
</tr>
<tr>
<td>Eng 371—The Structure of Modern English</td>
<td>3</td>
</tr>
<tr>
<td>Eng-Educ 329—Methods of Teaching English</td>
<td>3</td>
</tr>
<tr>
<td>Eng 450—Problems in Composition</td>
<td>3</td>
</tr>
<tr>
<td>Eng 482—Literature for the High School Teacher</td>
<td>3</td>
</tr>
<tr>
<td>SpCo 111—Introduction to Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Electives—Courses in English</td>
<td>21</td>
</tr>
</tbody>
</table>

*Among the elective courses there must be at least one upper division course in American literature and one upper division course in British literature. English 390 and other courses in General Literature may also be taken. Additional electives from the related fields of Speech Communication, Drama, and Journalism are strongly recommended.

English 160 may not be included in the major or the minor.

GENERAL SCIENCE (Major Only)

Does not qualify for teaching Chemistry or Physics

<table>
<thead>
<tr>
<th>Major Field (78 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro 101—Elementary Microbiology</td>
</tr>
<tr>
<td>Bot-Zool 111—Introduction to Biology</td>
</tr>
<tr>
<td>Bot 114—General Botany</td>
</tr>
<tr>
<td>Bot 280—Local Flora</td>
</tr>
<tr>
<td>Chem 101-2 and 104—General Chemistry and Lab</td>
</tr>
<tr>
<td>Chem 169 and 164—Survey of Organic Chemistry</td>
</tr>
<tr>
<td>Educ 304—Conservation of Natural and Human Resources</td>
</tr>
<tr>
<td>Geol 101—Introduction to Geology</td>
</tr>
<tr>
<td>Geol 111-2-3—General Physical Geology</td>
</tr>
<tr>
<td>Astron 131—Elementary Astronomy</td>
</tr>
<tr>
<td>Zool 112-2—General Zoology</td>
</tr>
<tr>
<td>Zool 206—Field Zoology</td>
</tr>
<tr>
<td>Educ 426—Methods of Teaching Secondary Science</td>
</tr>
<tr>
<td>Electives—Courses from Geology, Botany, Chemistry, Physics, Zoology</td>
</tr>
</tbody>
</table>

**Prereq = Math 116-7 (10 cr.).
<table>
<thead>
<tr>
<th>GEOGRAPHY</th>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 101</td>
<td>Physical Elements of Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 105</td>
<td>Introductory Human Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 201</td>
<td>Map Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>Geog 301</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 390</td>
<td>Geography of North America</td>
<td>3</td>
</tr>
<tr>
<td>Geog 401</td>
<td>Cultural Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 445</td>
<td>Urban Geography</td>
<td>5</td>
</tr>
<tr>
<td>Geog 370</td>
<td>Landform Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Geog 430</td>
<td>Population and Resource Geography</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives-Courses from Social Science and Physical Science Areas**

*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.

**18 credits should be selected from one department in the social science area or from one department in the physical science area; the remaining 6 credits should be from one department in the other area.

**GERMAN**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ger 121-3-3</td>
<td>Elementary German</td>
</tr>
<tr>
<td>Ger 201-2-3</td>
<td>Intermediate German</td>
</tr>
<tr>
<td>Ger 301-2</td>
<td>Oral and Written Expression</td>
</tr>
<tr>
<td>Ger 303</td>
<td>German Civilization and Culture</td>
</tr>
<tr>
<td>Ger 312-3</td>
<td>Survey of German Literature</td>
</tr>
<tr>
<td>Ger 401</td>
<td>Applied Linguistics</td>
</tr>
<tr>
<td>Ger 420</td>
<td>Advanced Composition</td>
</tr>
</tbody>
</table>

**ITALIAN**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ital 101-3-3</td>
<td>Elementary Italian</td>
</tr>
<tr>
<td>Ital 201-3-3</td>
<td>Intermediate Italian</td>
</tr>
<tr>
<td>Ital 301-3</td>
<td>Oral and Written Expression</td>
</tr>
<tr>
<td>Ital 303</td>
<td>Italian Civilization and Culture</td>
</tr>
<tr>
<td>Ital 311-3</td>
<td>Survey of Italian Literature</td>
</tr>
<tr>
<td>Ital 401</td>
<td>Applied Linguistics</td>
</tr>
<tr>
<td>Ital 402</td>
<td>Advanced Composition</td>
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**HISTORY-POLITICAL SCIENCE**

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<tr>
<th>Major Field</th>
<th>Minor Field</th>
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<tbody>
<tr>
<td>Hist 104-5-6</td>
<td>European Civilization</td>
</tr>
<tr>
<td>Hist 102-4-5</td>
<td>United States History</td>
</tr>
<tr>
<td>Hist 201-2</td>
<td>American Government</td>
</tr>
<tr>
<td>Pol Sci 301-2</td>
<td>Introduction to International Relations</td>
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**Electives-Methods of Teaching Social Studies in Secondary Schools**

*Must include at least 15 credits of upper division courses.

**HEALTH, PHYSICAL EDUCATION**

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<tr>
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<tr>
<td>HPER 470</td>
<td>Physiology of Exercise</td>
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**JOURNALISM**

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**Electives-Methods of Teaching Social Studies in Secondary Schools**

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**Electives-Methods of Teaching Social Studies in Secondary Schools**

*Must include at least 15 credits of upper division courses.
**LATIN**

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<th>Major Field</th>
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<tbody>
<tr>
<td>(48 credits)</td>
<td>(36 credits)</td>
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</table>

- **Lat 101-2-3—Elementary Latin**
- **Lat 211-2-3—Latin Readings**
- **Lat 300—Major Latin Writers**

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

*Credits will be allowed for exempted courses.

**LIBRARY SERVICE**

(Minor Only)

<table>
<thead>
<tr>
<th>Education in Library Science</th>
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<tbody>
<tr>
<td>(30 credits)</td>
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**MUSIC**

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<th>Major Field</th>
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<tbody>
<tr>
<td>(55-67 credits)</td>
<td>(30-41 credits)</td>
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</table>

- **Mus 100—Performance Minor**
- **Mus 111-2-3—Theory I**
- **Mus 125—Introduction to Music Literature**
- **Mus 136—Aural Perception I**
- **Mus 201, 400—Performance Major**
- **Mus 211-2-3—Theory II**
- **Mus 237—Aural Perception II**
- **Mus 325—School Music**
- **Mus 331—Conducting Methods and Materials**
- **Electives—From Courses Listed Below**
- **Mus 320—Piano & Method & Mater.—3 cr.**
- **Mus 323—School Music—2-6 cr.**

*Mus 100—Performance Minor*

- Must include at least two courses in history, one in economics, one in geography, and one in sociology.

**PHYSICS**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
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<tbody>
<tr>
<td>(45 credits)</td>
<td>(30 credits)</td>
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</table>

- **Phys 201-2-3—General Physics**
- **Phys 301—Vector Analysis**
- **Phys 322—Electricity**
- **Phys 322—Light**
- **Phys 341—Fundamentals of Modern Physics**
- **Phys 371—Mechanics**
- **Phys 441—Advanced Laboratory**
- **Electives—Any Courses in Physics and Astronomy**

*Prerequisites: Approximately 45 credits in Mathematics courses*

**PSYCHOLOGY**

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
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</thead>
<tbody>
<tr>
<td>(50 credits)</td>
<td>(35 credits)</td>
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</table>

- **Psych 110—Introduction to Psychology**
- **Psych 111—Introduction to Experimental Psychology**
- **Psych 210—Learning**
- **Psych 230—Child and Adolescent Psychology**
- **Psych 240—Social Psychology**
- **Psych 310—Sensory Processes and Perception**
- **Psych 361—Abnormal Psychology**
- **Electives—Any Courses in Psychology**

*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.

**RUSIAN**

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

- **Russ 101-2-3—Elementary Russian**
- **Russ 111-2-3—Intermediate Russian**
- **Russ 301—Applied Linguistics**
- **Russ 302—Russian Composition and Conversation**
- **Russ 311-3-3—Survey of Russian Literature**
- **FL—Educ 390—Methods of Teaching Foreign Languages**
- **Electives—Any Upper Division Russian Courses**

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

*Credits will be allowed for exempted courses.

*Must be taken prior to the professional quarter.

*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**

(Major Only)

<table>
<thead>
<tr>
<th>Major Field</th>
<th>Minor Field</th>
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<td>(75 credits)</td>
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</table>

- **Econ 211—121-212—Introduction to Economic Theory I, II, III**
- **Geog 221—Political Geography**
- **Geog 335—Cultural Geography**
- **Hist 104-105-106—European Civilization**
- **Hist 201-3—United States History**
- **Pol Sci 201-2—American Government**
- **Soc 101—Introduction to Sociology**
- **Educ 430—Methods of Teaching Social Studies in Elementary Schools**
- **Electives—Upper Division Courses in Anthropology, Economics, Geography, History, Political Science, Sociology**

*Must include at least two courses in history, one in economics, one in geography, and one in sociology.

**SOCIOLOGY**

<table>
<thead>
<tr>
<th>Major Field</th>
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<tbody>
<tr>
<td>(48 credits)</td>
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- **Anth 152—Man and His Culture**
- **Soc 101—Introductory Sociology**
- **Soc 206—American Society**
- **Soc 301—Social Science Methods**
- **Soc 307—Introduction to Social Change**
- **Soc 308—Socialization**
- **Soc 308—Introduction to Complex Organizations**
- **Soc 310—Development of Social Thought**
- **Educ 430—Methods of Teaching Social Studies in Elementary Schools**
- **Electives—Upper Division Sociology Courses**

*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**

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<tbody>
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<td>(60 credits)</td>
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- **Span 101-2-3—Elementary Spanish**
- **Span 201-2-3—Intermediate Spanish**
- **Span 301—Oral and Written Expression**
- **Span 305—Comparative Civilizations and Culture**
- **Span 311-2-3—Survey of Spanish Literature**
- **Span 341—Applied Linguistics**
- **Span 402—Advanced Composition**
- **FL—Educ 390—Methods of Teaching Foreign Languages**
- **Electives—Any Upper Division Spanish Courses**

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

*Must be taken prior to the professional quarter.

*May substitute Span 402.**
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:

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.

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 50 credits in the major but not more than 60 credits in the department. English 100 does 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.

All students majoring or minoring in English, whether their degrees are taken in the department of English or the School of Education, will be required to take the basic core curriculum in English studies. Schedules A, B, and C presume such a core curriculum and build from that.

CORE CURRICULUM

I. English majors must satisfy the departmental composition requirement. All prospective English majors are expected to take English 100 in the freshman year, English 161, 163, 165—World Literature.

II. All students are expected to take, in addition English 200 in the sophomore year; two quarters in one sequence and one in the other from English 211-212-213; English 342 or 343; 3 credits from English 380 or 371. English 342 or 343; 3 credits from English 380 or 371.

III. The departmental foreign language requirement must be satisfied. For a degree in English a student is also expected to follow a balanced program of courses in the Fine Arts, in the Humanities (other than English), in the Social Sciences, and in the Natural Sciences.

SCHEDULE A: LITERATURE

Students who hope to do graduate study in English should supplement the above courses with the following required minimum.

English 483 (Chaucer); 3 credits from 491-492-493. The remaining credits required for completion of the minimum 50 may be selected from courses in General Literature, English, and American Literature numbered above 300. The maximum of courses up to 66 credits may include 401-402-403; 440, and 441.

SCHEDULE B: CREATIVE WRITING

Students whose major interest is the writing of fiction and poetry should supplement the core courses with the following minimum. This schedule is aimed at helping the student toward individual expression by giving him guided practice in writing, a working knowledge of modern techniques, and a foundation in critical self-appraisal.

REQUIREMENTS: 9 credits from 401, 402, 403, 405, 415, 445; 3 credits from 440, 441, 442; 2 credits from 491, 492, 493. The additional credits allowed up to a maximum of 66 may be taken from courses in General literature; and English and American literature and written courses numbered above 300.

SCHEDULE C: TEACHING

(For teacher certification requirements, see Education)

Students planning to teach English in high school should supplement the core courses with one of the following options:

Option 1

English 371, 372, 482; Speech 111.

Effective: Other electives may be chosen from courses in the department of English, in courses in General Literature and from the Related Fields. Among electives there must be at least one advanced course in American Literature and one advanced course in British Literature. Additional electives in Drama, Speech, and Journalism are strongly recommended.

For certification, a teaching minor in another field is required.

Option 2

(Extended major for single endorsement)

English 371, 372, 482; Speech 111. Sixty credits in English are required. The program is for Minnesota state teaching certification in English only. A teaching minor is not required.

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 the other disciplines which have variously called attention, particularly in teaching English and foreign languages. Although at present the University does not offer a 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 the government and foundation supported language programs in the U. S. and abroad. Refer to the Departments of Anthropology, English, Foreign Languages, Speech Communication, and Speech Pathology and Audiology for course offerings in linguistics.

Comparative literature is the study of literature beyond the confines of one national literature. It is especially concerned with the similarities and differences which can be observed in the literary productions in different languages. It makes comparisons from various points of view, studying, for example, movements, periods, genres, and themes. Certain types of comparative literature studies can be highly useful to students in such fields as psychology, philosophy, anthropology, and history, as well as to majors in English and foreign languages. Some of the courses in comparative literature require a reading knowledge of one foreign language. Students interested in working toward a degree in comparative literature (not offered by the University) should bear in mind that a reading knowledge of at least two foreign languages is necessary for advanced work in the field. See the listings under the departments of Foreign Languages and English for course descriptions.

GRADUATE WORK. See Graduate School Bulletin.

COMPOSITION

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

English 100 may be required selectively by schools or departments for any or all of their majors.

Students who do not achieve acceptable scores on the English section of the ACT take English 901, Remedial Expository Writing, and receive a "pass" grade before they may enter English 100.

001 REMEDIAL EXPOSITORY WRITING 3. (Credit not allowed toward any degree.) Emphasis on problems of basic mechanics (usage, punctuation, spelling, etc.), sentence structure, and simple organization. A special fee of $4.00 will be charged for this course.
CREATIVE WRITING

FOR UNDERGRADUATES

202 INTRODUCTION TO CREATIVE WRITING 3 prereq c/i. 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.

413-414-415 ADVANCED CREATIVE WRITING: POETRY 3 prereq 313-314-315 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.)

485 INDEPENDENT STUDIES 3 R-6. 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.)

599 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 R 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

383 LITERATURE FOR THE HIGH SCHOOL TEACHER 3. Open to seniors only. The literature usually taught in grades 9 through 13 with intensive study of a few selections.

FOR GRADUATES

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

LITERATURE

FOR UNDERGRADUATES

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


200—APPLIED LITERARY CRITICISM 3. The application of literary theories and methods of literary criticisms to 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 JACOBBIAN DRAMA 3 prereq 9 credits of Literature. Representative plays from Evergman through Ford and Shirley, plus a few early plays of Shakespeare.

342-343 SHAKESPEARE 3 prereq credits of Literature. Enter any quarter. (342) Intensive reading of three of Shakespeare's plays, one of which will be Hamlet. (345) Extensive reading of Shakespeare's plays.

344 THEORIES OF DRAMA 3 prereq 1 quarter of 307-308-309. Typical literary criticism from Aristotle to contemporary critics and the reading of representative 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.)

386 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 Shakespeare.

388 BRITISH LITERATURE: SEVENTEENTH CENTURY. POETRY AND DRAMA 3 prereq 12 credits of Literature. Poems and plays of the period, including some French and physical poetry beginning with Donne, and classical poetry beginning with Jonson, and their interrelationship as seen in poets like Carew and Marvell.

389 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 on Johnson, and Fielding.

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

393 BRITISH LITERATURE: MIDDLE AND LATE NINETEENTH CENTURY 3 prereq 9 credits of Literature. For credit 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/i. Varies widely.

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

423-424-425 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.
ENVIRONMENTAL STUDIES, FOREIGN LANGUAGES—39

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 languages 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 the patterns of living and the 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 teaching by providing a solid basis for graduate study 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 modern foreign language in high school (not in a college or university) and who wishes to continue that foreign language at this university should enroll as follows:

A) Active skills: four years of a language in high school, courses numbered 300 and above; three years in high school, 202; two years in high school, 201; one year in high school, 102; or if some time has intervened, 101.

B) Reading skills: three years in high school, 211; two years in high school, 202; one year in high school, 102.

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 and language credit in a second modern language acquired either in high school or at another college or university. Requirements for the departmental (academic) majors are listed below for languages which are taught here. Requirements for the teaching majors and minors are listed separately under Education. English 100 must 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 careers, the courses entitled Introduction to the Humanities (Humanities 100-102-103) and Classical Mythology (Humanities 160). All majors in Romance Languages are strongly urged to take the course, Introduction to Romance Philology, R Ph 366, as part of their upper division work.

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 disciplines beyond the usual linguistic sciences. A student interested in linguistics subjects would prepare a student to enter graduate work in linguistics and would provide him with a background in teaching certain foreign languages. Required for graduate work in certain government and foundation supported language programs in the U. S. and abroad. Refer to the Departments of Anthropology, English, Foreign Languages, Speech Communication, and Speech Pathology and Audiology for course offerings in linguistics.

Comparative literature is the study of literature beyond the confines of one national literature. It is especially concerned with the similarities and differences which can be observed in the productions in different languages. It makes comparisons from various points of view, studying, for example, movement, genres, and themes. Certain types of comparative literature studies can be highly useful to students in such fields as psychology, philosophy, anthropology, and history as well as to specialists in foreign languages. Some of the courses in comparative literature require a reading knowledge of more than one foreign language. Students interested in working toward a degree in comparative literature should have a reading knowledge of at least two foreign languages is necessary for admission to the graduate program. See the listings under the departments of Foreign Languages and English for course descriptions.

GRADUATE WORK. See Graduate School Bulletin.
CLASSICS

MAJOR REQUIREMENTS: Candidates for the Bachelor of Arts with a major in Classics 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 9 credits of Latin 300 (490) and 9 credits of Greek 300.
3. Also recommended for majors are: History 302, 303 and 304, or 201 and 202; General 151, 152, 153; Humanities 160; Philosophy 296.

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 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 33 credits of upper division work in French, which (Teaching majors may substitute the Teaching of Foreign Languages 300 for 3 credits of upper division French).
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, 335, 336. French 303 may be substituted for one quarter of history, but if so, it may not also be counted as a French course.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101-102-103 Elementary French 5.

Students may elect either the audio-lingual track or the reading skill track. The reading skill track, three quarters in length, is designed for students who wish a reading knowledge but do not plan to continue to Intermediate French 201-202-203.

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.
321 (421) MEDIEVAL FRENCH LITERATURE 3 prereq 203.
322 (422) FRENCH RENAISSANCE 3 prereq 203.
323 (423) 17TH CENTURY FRENCH LITERATURE 3 prereq 203.
331 (431) 18TH CENTURY FRENCH LITERATURE 3 prereq 203.
332 (432) 19TH CENTURY FRENCH LITERATURE 3 prereq 203.
333 (433) CONTEMPORARY FRENCH LITERATURE 3 prereq 203.
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.
403 ADVANCED CONVERSATION 3, prereq 303 or c/l.
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 "PHILOSOPHES" 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 33 credits of upper division work in German, which must include 211-312-313. (Teaching majors may substitute the Teaching of Foreign Languages 300 for 3 credits of upper division German).
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, 320, 321, 322. 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.

Students may elect either the audio-lingual track or the reading skill track. The reading skill track, four quarters in length, with an emphasis on scientific German in the fourth quarter, is designed for students who wish a reading knowledge but do not plan to continue to Intermediate German 201-202-203.

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/l. Emphasis on active use of German.
303 GERMAN CIVILIZATION AND CULTURE 3 prereq 302 or c/l.
311-312-313 (301-302-303) SURVEY OF GERMAN LITERATURE 2 prereq 203. Enter any quarter.

401 APPLIED LINGUISTICS 3 prereq 302 or c/l. Specific problems in contrastive phonology, morphology, and syntax.
FOREIGN LANGUAGES—41

ITALIAN

MAJOR REQUIREMENTS: Candidates for the degree of Bachelor of 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 33 credits of upper division work in Italian, which must include 311-312-313. (Teaching majors may substitute the Teaching of Foreign Languages 290 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, 324, 355, 336.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY ITALIAN 5.

Students may elect either the audio-lingual track or the reading skill track. The reading skill track, three quarters in length, is designed for students who wish a reading knowledge but do not plan to continue to Intermediate Italian 201-202-203.

201-202-203 INTERMEDIATE ITALIAN 4 prereq 103 or =.

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 201-202 and 211-212.

211-212 ITALIAN 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 ORAL AND WRITTEN EXPRESSION II 3 prereq 301 or c/i. Emphasis on active use of Italian.
303 ITALIAN CIVILIZATION AND CULTURE 3 prereq 202 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.
431-432 ITALIAN RENAISSANCE 3 prereq 311-312-313, or coreq and c/i.
433 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. Studies in major authors, periods, or genres.
SPANISH

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

1. Spanish 101 to 203 inclusive, or equivalent.
2. At least 33 credits of upper division work in Spanish, which must include 311-312-313 and 321-322-323. (Teaching majors may substitute the Teaching of Foreign Languages 390 for 3 credits of upper division Spanish).
3. Five quarters, or equivalent, of another foreign language.
4. Spanish majors are advised to take at least one quarter of Hispanic American History (History 285-286-287) when this course is offered.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY SPANISH 5.

Students may elect either the audio-lingual track or the reading skill track. The reading skill track, three quarters in length, is designed for students who wish a reading knowledge but do not plan to continue to Intermediate Spanish 201-202-203.

201-202-203 INTERMEDIATE SPANISH 4 prereq 103 or c/i.

Audio-lingual emphasis. For students who plan to obtain a major or minor in Spanish, or for those particularly interested in the active skills. Credit not allowed for 201-202 and 211-212.

211-212 (215) SPANISH 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.

FOR UNDERGRADUATES AND GRADUATES

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 Spanish.

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

311-312-313 (301-302-303) SURVEY OF SPANISH LITERATURE 2 prereq 203. Enter any quarter.


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

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

405 ADVANCED CONVERSATION 3 prereq 303 or c/i.

421 (355) SPANISH NOVEL TO 1800 3 prereq 311-312-313, or concurrent registration and c/i.

422 (351) 19TH CENTURY SPANISH NOVEL 3 prereq 311-312-313, or concurrent registration and c/i.

423 (363) 20TH CENTURY SPANISH NOVEL 3 prereq 311-312-313, or concurrent registration and c/i.

431 (333) SPANISH DRAMA TO 1800 3 prereq 311-312-313, or concurrent registration and c/i.

432 (352) 19TH CENTURY SPANISH DRAMA 3 prereq 311-312-313, or concurrent registration and c/i.

433 (361) 20TH CENTURY SPANISH DRAMA 3 prereq 311-312-313, or concurrent registration and c/i.

441 (381) SPANISH POETRY OF THE GOLDEN AGE 3 prereq 311-312-313, or concurrent registration and c/i.

442 NINETEENTH CENTURY SPANISH POETRY 3 prereq 311, 312, 313 or coreq and c/i.

443 TWENTIETH CENTURY SPANISH POETRY 3 prereq 311, 312, 313 or coreq and c/i.

450 SPANISH AMERICAN DRAMA 3 prereq 311, 312, 313 or coreq and c/i.

451 SPANISH AMERICAN ESSAY 3 prereq 311, 312, 313 or coreq and c/i.

452 SPANISH AMERICAN NOVEL 3 prereq 311, 312, 313 or coreq and c/i.

453 SPANISH AMERICAN POETRY 3 prereq 311, 312, 313 or coreq and c/i.

460 HISTORY OF THE SPANISH LANGUAGE 3 prereq 311-312-313, or concurrent registration and c/i.

490 (491) SEMINAR 3 R-18 prereq 311-312-313. Studies in major authors, periods, or genres.

FOR GRADUATES

111-112 SPANISH FOR GRADUATE STUDENTS 4. Intensive reading course to prepare graduate students to pass the reading knowledge exam required for advanced degrees. (Does not carry graduate credit.)

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

590 GRADUATE SEMINAR 3 R-9.


THE TEACHING OF FOREIGN LANGUAGES

FOR UNDERGRADUATES AND GRADUATES

390 (391) METHODS OF TEACHING FOREIGN LANGUAGES 3 prereq Foreign Language 200 or equivalent. Fundamental concepts, objectives, and techniques in the teaching of modern foreign languages. Separate sections in individual languages whenever practicable.

395 METHODS OF TEACHING FOREIGN LANGUAGES IN ELEMENTARY SCHOOLS 3 prereq FL 203 or c/i. Fundamental concepts and activities that the teaching of foreign languages in elementary schools. Separate sections in individual languages whenever practicable.

FOR GRADUATES

501 RESEARCH METHODS 1. Required of all candidates for an advanced degree in any foreign language.

590 (591) SEMINAR ON LANGUAGE TEACHING 9. For language teachers. Credits may be applied toward a graduate degree in either languages or Education.

FORESTRY

The School of Forestry offers a wide variety of programs concerned with natural resources and the human environment. The planning, development, and administration of environmental programs require professionals with many talents. There is a need for specialists as well as for broadly trained generalists, all of whom understand the complex interrelationships of environmental forces and man.

Increasing concern for the wise use and maintenance of quality environment in Montana and throughout the world is extending areas of employment for professional resource managers and conservationists. Graduates of the School of Forestry are employed by government agencies, private companies, private conservation organizations, research organizations, consulting firms, and educational institutions.

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.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. Candidates must complete a curriculum satisfactory to the staff of the School of Forestry. This curriculum must include a minimum of: 45 quarter credits in courses classified in composition or speech communication; and nine credits selected from mathematics, statistics, and computer science. The student's degree program and curriculum will be worked out with his adviser according to guidelines set forth in the School of Forestry bulletins. Each student will be expected to select his area of emphasis during his first year. To continue course work in the School of Forestry beyond the freshman year the student must maintain a grade point average of 2.00 or above. Transfer students must have a grade-point average of 2.5 or above to be admitted to the School of Forestry.

SPECIAL EXPENSE CHARGE. All students enrolled in the School of Forestry or taking forestry courses are assessed $18.00 per quarter for travel, laboratory materials and other instructional costs.

BACHELOR OF SCIENCE IN RESOURCE CONSERVATION

This degree program accommodates a broad and often diverse array of student interests in the human environment. Consulting with faculty advisors, a BSRC student designs a program of study unique and appropriate for him. This program may be career oriented or may be of a more reflective nature, focusing, for ex-
ample, on the role of conservation and environmental quality in the
great problems of the time. The emphasis in the BSRC program
is on the student. His needs, aspirations, and motivation are essen-
tial in designing a program of study that can and typically does
draw heavily on the courses and educational facilities of the entire
University.

Areas of professional emphasis under the Bachelor of Science
In Resource Conservation include:
- Land-use Planning
- Natural Resource Management
- Conservation Information and Education
- Range Conservation

BACHELOR OF SCIENCE IN FORESTRY

The emphasis of this degree is toward meeting the professional
requirements for a career in forestry and related land management
fields. The program allows the student considerable freedom in the
selection of courses within established professional standards.

Areas of emphasis under the Bachelor of Science in Forestry
degree are:
- Forest Resources Management
- Forest Business
- Range Management

MAJOR IN FOREST SCIENCE

This major is for students who wish to prepare for graduate
career in forestry, natural resource conservation, and related
fields. The program allows the student considerable freedom in the
selection of courses within established professional standards.

The emphasis of this degree is toward meeting the professional
requirements for a career in forestry and related land management
fields. The program allows the student considerable freedom in the
selection of courses within established professional standards.

BACHELOR OF SCIENCE IN WILDLIFE BIOLOGY

The School of Forestry participates with the Departments of
Botany and Zoology in a degree program in Wildlife Biology. For
specific information refer to the Wildlife Biology listing in this
catalog.

GRADUATE PROGRAMS

Graduate degrees offered by the School of Forestry include:
- Master of Science in Resource Conservation
- Master of Science in Forestry
- Master of Forestry
- Master of Resource Administration
- Master of Science in Wildlife Biology (cooperative program
  with Botany and Zoology)
- Doctor of Philosophy

For further information on these programs see the 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 Zoel 170).

190 SURVEY OF FOREST-Y 2 (2-0). The field and subject
matter of the forestry profession.

191-192-193 INTRODUCTION TO ECOLOGY AND ENVIRON-
MENTAL MANAGEMENT 3 (3-0). An interdisciplinary presentation
of social, political, scientific and humanistic aspects of natural
resource management. (191) Development of philosophies of natural
resource use: discussion of social, economic and political restraints
on resource policy. (192) Contribution of basic sciences to the
understanding of ecosystem management. (193) On-site obser-
vation and discussion of management problems. Enter any quarter.

199 FORESTRY PROBLEMS V prereq c/l.

210 INTRODUCTORY SOILS 4 (3-3) prereq Chem 101-102, 104-
105 or 106. The chemical, physical, biological, and morphological
characteristics of soils.

220 PRINCIPLES OF TECHNICAL EXPRESSION 2 (2-0). The
criteria of good technical expression—clarity, directness, logical or-
der, and terseness.

250 FOREST INSTRUMENTS 1 (0-3). The use, care and adjust-
ment of instruments used in forest surveying and the field practices
of forestry.

252 LAND SURVEY SYSTEMS AND GRAPHICS 4 (3-3) prereq
250, c/l. The history and subdivision of public lands; measurements
and legal aspects of property boundary lines and corners. Drafting
techniques. Maps, charts, contour and profile lines.

290-291 DENDROLOGY 2 (1-3). 3 (2-3) prereq Bot 114, 115 or
c/l. Identification, classification, silvical characteristics, range and
economic importance of the principal forest trees of the United

299 FORESTRY PROBLEMS V prereq c/l.

300 FOREST MEASUREMENTS 4 (3-4) prereq 250, 252, c/l. The
measurement, inventory, volume and growth determination of
timber and other forest land resources.

309 FARM FORESTRY 2 (2-4) prereq c/l. The principles of
forest mensuration, management, silviculture and soils for small
woodland holdings.

315 FORESTRY ECOSYSTEM LABORATORY 2 (0-6) prereq 310
and c/l. Basic forest ecology field technique. Vegetation surveys
coupled over an elevational gradient in a forest. Field trips will
exemplify the concepts developed in For 310.

321 FOREST FIRE PLANS 3 (3-0) prereq junior standing and
322 Area pre-suppression planning and fire use planning. Action
planning on project size fires.

323 RANGE LIVESTOCK PRODUCTION 2 (2-0) prereq 230 and
c/l. Selection, production, and management of range livestock.

399 FORESTRY PROBLEMS V prereq c/l.

496 SENIOR THESIS 3 prereq senior standing. Preparation of
a major paper based on study or research in a field selected accord-
ing to the needs and objectives of the student.

FOR UNDERGRADUATES AND GRADUATES

301 FOREST BIOMETERS 4 (3-3) prereq Math 106 or 109.

304 CONSERVATION OF NATURAL AND HUMAN RESOURCES
IN MONTANA 3 prereq c/l. An interdisciplinary survey of physical,
ecology and use of natural resources, including man, climate, and
social sciences. Planning, management and administration, and similar
fields.

401 FOREST RESOURCES MANAGEMENT 3 (3-0).

402 WILDLAND RECREATION MANAGEMENT 3 (3-0).

403 RANGE MANAGEMENT 3 (3-0).

410 FOREST RESOURCES MANAGEMENT 2 (3-0).

421 WILDLAND RECREATION MANAGEMENT 3 (3-0).

430 WOOD ADHESIVES TECHNOLOGY 3 (3-0) prereq 340 and
junior standing.

431 SILVICULTURE 4 (3-2) prereq 300, 310 or c/l. Concepts of
silviculture with emphasis on methodology.

432 WILDLIFE IMPROVEMENT 3 (2-4) prereq 311. Plant
breeding methods for genetically improved forest tree seed; quanti-
tative genetics.

435 NATURAL RESOURCE POLICY 3 (3-0).

436 NATURAL RESOURCE ADMINISTRATION 3 (3-0).

437 WILDLAND RECREATION MANAGEMENT 3 (3-0).

440 WOOD ADHESIVES TECHNOLOGY 3 (3-0) prereq 340 and
junior standing.

450 FOREST PRODUCTS AND INDUSTRIES 4 (3-4) prereq
junior standing.

451 ADVANCED SURVEYING 4 (2-4) prereq 252 and c/l.

455 AERIAL PHOTOGRAMMETRY 3 (2-3).

457 TRANSPORTATION SYSTEMS 4 (4-0) prereq 252. Trans-
portation planning and development in relation to resource use, with
emphasis on conflicts of interest.

460 RANGE MANAGEMENT 4 (3-3) prereq junior standing and
c/l.

461 RANGE FORAGE PLANTS 4 (0-6) prereq 360, Bot 306 and
c/l.

462 RANGE ECOLOGY 3 (2-3) prereq Bot 250, 251.

470 WILDLIFE CONSERVATION 3 (3-0) prereq 360 and c/l.

471 WILDLAND RECREATION MANAGEMENT 3 (3-0).

472 RECREATION AREA PLANNING AND DESIGN 4 (3-4)
prereq 385. Over emphasis placed on design.

473 HYDROLOGIC PRINCIPLES 3 (2-4) prereq c/l.

474 CHEMISTRY OF PLANT CONSTITUENTS. (See Chem 390.

475 CHEMISTRY OF WOOD PRODUCTS. (See Chem 391.)

476 WILDERNESS PLANNING AND MANAGEMENT 3 (3-0).

480 FOREST RESOURCE INVENTORY 4 (0-8) prereq 300, 301.

481 TIMBER MANAGEMENT 4 (4-0) prereq 310, 421 or c/l.

490 FOREST RESOURCES FIELD TRIP 1-3 prereq upper divi-
sion student and c/l. 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 410-411 or c/i. The ecological development of forest regions; current silvicultural problems and practices.
415-SEMINAR IN FOREST ECOLOGY 3 (3-4) prereq two of the following: 310, 362, Bot 385, 390, 395, 396. An in-depth study of an area of relevance and current interest in ecology. Studies may include productivity, ecosystem stability and energy relations. Each student will present a seminar critically appraising the research done on some aspect of the study area.
416 ANALYSIS OF FOREST ECOSYSTEMS 5 (0-10) prereq c/l. Discussion and criticism of recent ecosystem studies. Preparation of a comprehensive research study plan for analyzing a Northern Rocky Mountain forest.
421 FOREST ECONOMICS 5 (5-0) 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 421 or c/i.
425 INDUSTRIAL FORESTRY 3 (3-2 labs by arrangement) prereq 421 and 480 or c/i.
430 FOREST METEOROLOGY 4 (4-0).
440 MECHANICALLY DERIVED WOOD PRODUCTS 3 (3-0) prereq junior standing.
441 SAWMILLING AND LUMBERING 3 (2-4) prereq junior standing in the School of Forestry.
442 WOOD SEASONING AND PRESERVATION 3 (3-0) prereq junior standing in the School of Forestry.
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.
458 GROWTH-QUALITY RELATIONSHIPS OF WOOD 3 (1-4) prereq 311, 340 or c/i.
460 RANGE ANALYSIS AND SURVEY TECHNIQUES 4 (2-6) prereq 360 and c/i.
461 RANGE LIVESTOCK NUTRITION 3 (2-3) prereq 360 and c/i.
463 RANGE ECONOMICS 3 (3-0) prereq 360, Econ 201 and c/i.
464 RANGE ADMINISTRATION 2 (2-0) 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 308, 309 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). (480) prereq senior standing. (481) prereq 480 or c/i. (482) prereq 481 or c/i.
483 PARK MANAGEMENT 3 (3-0) prereq 383, 384 and c/i.
485 WATERSHED MANAGEMENT 3 (2-4) prereq 385.
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 (2-0).
496 FORESTRY AND ECONOMIC DEVELOPMENT 2 (2-0) prereq c/i.
497 WORLD RESOURCE PROBLEMS 2 (2-0) prereq c/i.
499 FORESTRY PROBLEMS V prereq completion of basic undergraduate work and c/i. Individual problem course. Offered by different instructors under various titles.

FOR GRADUATES
500 ADVANCED FOREST MANAGEMENT 3 prereq 401, 421 and 480.
GEOGRAPHY

is concerned with understanding the earth and man. An interest in the place-to-place variations of both man and their terrestrial environments is basic, but the overriding objective of the study of Geography is an understanding of the physical and social processes that influence our 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 and 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 differentiations of earth-using 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 sound basic knowledge 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. A major in geography consists of 75 credits distributed as follows: (1) 3 credits in geography (maximum 65), including geography 101 and 102, two courses in physical geography, two courses in cultural geography, one regional course, one field course, and cartography; (2) At least 27 credits in science and social science, including 9 and 18, or 18 and 9 respectively selected from a department in each of these two major areas: anthropology, archaeology, anthropology, economics, history, political science, or sociology (social science) and the biological sciences, meteorology, mathematics, or physics and astronomy (science). Course sequences in other areas may be arranged with the consent of the department; (3) English composition, 3 credits. (Majors with obvious deficiencies in composition, and preparation of materials in geographic research, including interpretation, construction, and use of important maps and maps. Cartographic techniques utilized in the presentation of data.

FOR UNDERGRADUATES AND GRADUATES

300 GEOGRAPHY OF NORTH AMERICA 3 prereq 101 or =. Cultural areas of Canada and the United States with emphasis on differences in regions.


305 EUROPE 3 prereq 101 or =.

310 SOUTH AMERICA 3 prereq 101 or =.

311 CENTRAL AMERICA, MEXICO AND THE CARIBBEAN 3 prereq 101 or =.

312 AFRICA 3 prereq 101 or =.

315 THE FAR EAST 3 prereq 101 or =.

318 THE U.S.S.R. 3 prereq 101 or =.

319 MONTANA 3.

320 THE PACIFIC NORTHWEST 3 prereq 101 or =.


331 POLITICAL GEOGRAPHY 3. Cultural, physical and distributional aspects of politically organized units. The traditions of geographic thought that condition political decisions in local, national, and international affairs.

333 CULTURAL GEOGRAPHY 3. The cultural approach to understanding the differing patterns of human use of the earth.

345 URBAN GEOGRAPHY 5 prereq 101 or =. The growth, morphology, and functions of towns and cities. Examination of the contemporary urban scene.

350 INTRODUCTORY METEOROLOGY 3 prereq c/l. Dynamics of atmospheric circulations, regional and broad-scale weather systems.

360 CLIMATOLOGY 4 prereq 101 or =. Elements and controls of climate. Classification and distribution of climatic types.

365 GEOGRAPHY OF ECOSYSTEMS 3 prereq 101 or = c/l. Geographical study of ecosystems. Major attributes, modification by man's activities, spatial arrangement, cartographic representation, usefulness in planning and land management.

370 LANDFORM ANALYSIS 3 prereq 101 or =. Topographic elements of the earth's surface with emphasis on processes of morphologic change.

375 BIOGEOGRAPHY OF NORTH AMERICA 3 prereq c/l. Broad-scale ecoregions of the North American continent. Present character, natural antecedents, resource potentials, implications for planning.

390 FIELD GEOGRAPHY V R-12 prereq c/l. Titles vary.

400 HISTORICAL GEOGRAPHY 3 c/l. Geography of past periods with the aim of understanding geographical patterns and processes past and present.

401 ADVANCED PHYSICAL GEOGRAPHY 3 prereq c/l. Specialized aspects of Physical Geography.

405 THE HISTORY OF GEOGRAPHY 3 prereq 12 credits in Geography or =. Herodotus to the nineteenth century.

410 PROBLEMS IN GEOGRAPHY V R-12 prereq 12 credits in Geography.

413 POPULATION AND RESOURCE GEOGRAPHY 3 prereq c/l. Geographic aspects of problems arising from the relationships between human populations and their resource use.

415 ADVANCED REGIONAL GEOGRAPHY 3 prereq c/l. Topics vary.

420 ADVANCED CULTURAL GEOGRAPHY 3 prereq c/l. Topics vary.

450 SEMINAR IN GEOGRAPHY V R-12. Topics vary.

FOR GRADUATES

500 MODERN GEOGRAPHIC THOUGHT 3. Geographical concepts, approaches, and techniques developed in the twentieth century.

530 SEMINAR IN CULTURAL GEOGRAPHY 3 R-9 prereq c/l. Concepts, methodology, and research in cultural aspects of Geography. Topics vary.

570 SEMINAR IN PHYSICAL GEOGRAPHY 3 R-9 prereq c/l. Concepts, methodology, and research in physical aspects of Geography. Topics vary.

580 RESEARCH METHODS AND MATERIALS 3. Collection and preparation of materials in geographic research, including interviewing, library sources, and the cartographic presentation of data.

699 THESIS V R-15.
GEOLGY

Geologists study the earth, interpreting the processes and events which have made it what it is. They apply the results of all other scientific fields to this effort. Insights recently gained have brought geology to a state of scientific revolution fully comparable to that brought to physics years ago by the discovery of radioactivity. Geologists concern themselves with problems as diverse as origin of ocean basins, movement of continents, earthquakes, activity of volcanoes, composition of the moon, crystal structure of minerals, behaviour of streams, evolution of life, finding petroleum and ore deposits, and quality of the environment. The variety of geological techniques includes X-ray microscopy, aerial photography, geologic mapping, and seismographic work as well as the classic hammer and coffee pot. Geologists find employment in a wide variety of occupations including university teaching, government, oceanographic exploration, federal and state geological surveys, water and other environmental resource problems, and petroleum and mining exploration and development.

The Department of Geology offers bachelors, masters and doctoral degrees as well as a bachelors degree in education with a major in earth science. All degree programs in the department involve some combination of field and a combination of applied and theoretical approaches requiring a sound general background in other sciences. 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, that high school preparation include as much mathematics and science as possible.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN GEOLGY. In addition to the general requirements, the department requires the following courses for each undergraduate degree in geology: Geography 101, 102, 130, 200, 202, 215, 216, 335, 332, 331, 429.

Also required are 60 credit hours in allied sciences, to be selected by the student in consultation with his advisor, from courses in the fields of mathematics, chemistry, physics, computer science, and biological sciences. Science courses listed under General Courses of Requirements are designed for education majors may not be counted towards the departmental science requirements. Most graduate schools and professional employers require college courses in mathematics, physics, chemistry, and biology. Students are therefore strongly advised to take a full year of courses in each of these subject areas.

The department also requires three quarters of Foreign Language or equivalent preparation: English 100 and two other courses given by the English Department in which composition in English is a major part of the course. English 450 may be substituted for one of the composition options. English 450 is strongly recommended.

The grade of "P" or "F" is given for all work in Geography 590, 595, 650, and 689. Geology majors, with the consent of the instructor, take Geology courses on a Pass/Not Pass basis, provided that the course is not required for the major.

FIELD TRIP EXPENSES. Students should go to the Department of Geology office for a statement of expenses connected with field trips.

FOR UNDERGRADUATES

For explanation see Course Description (Index)

*Courses offered alternate years.

101-102 INTRODUCTION TO GEOLOGY 4 (2-2) Prereq 102 or 110. Geologic activity of streams, waves, wind, and ice; relations to landscape; formation of sediments and sedimentary rocks; stratigraphic time and measurement of geologic time; growth, movement and composition of continents; igneous and metamorphic rocks; earthquakes; deformation of rocks; mineral deposits; and methods. 101 and 102 may be taken concurrently.

103 ENVIRONMENTAL GEOLOGY 4 (3-3). Geology as related to quality of man's environment.

110 PHYSICAL GEOLOGY Su 5 (3-4). Minerals, rocks, and structure of the earth's crust; the dynamic processes, volcanism, deformation, and weathering which shape the earth landscape. Credit not allowed for 110 and 110-102.

130 FIELD METHODS 3 (1 + all day Saturday field trips) Prereq 102 or 110. Problems covering wide range of geologic topics; techniques of field work.

200 GENERAL PALEONTOLOGY 4 (3-2) primarily for science majors. General principles of paleontology, evolution, and history of plants and animals.

202 PRINCIPLES OF STRATIGRAPHY 5 (3-4) Prereq or coreq 102. Processes of sedimentation and methods of analyzing stratigraphic records, including correlation, sedimentary rock description and identification.

210 INTRODUCTION TO ROCKS AND MINERALS 4 (2-4) Prereq 102 or 110. Common rock-forming and economic minerals. Various rock types, their texture, mineralogy, origin, occurrence, and physical and chemical properties, laboratory mainly hand specimen study. (Credit not allowed toward a geology degree.)

215 INTRODUCTORY MINERALOGY 5 (3-4) Prereq one quarter of chemistry, preferably freshman level. Solid state considerations and principles of crystal chemistry. Systematic mineralogy of about 80 rock forming and economically important minerals.

216 (315) PETROLOGY 4 (2-4) Prereq 215. Identification, description, and origin of igneous and metamorphic rocks.

250 (356) INTRODUCTION TO ECONOMIC GEOLOGY 4 (4 + Field Trips) Prereq 102 or 110. The geology of metallic, nonmetallic and solid and liquid fuel deposits of the world. Emphasis on descriptive, economic, geographic and utilization aspects of non-renewable resources.

310 GEOMORPHOLOGY 3 (2-2) Prereq 102 or 110. Landforms in terms of processes which create them. Basic processes of physical geology. Emphasis on modern concepts.

325 PROBLEMS V Prereq 30 cr. in Geology or = and c/l. Supervised investigation in any phase of geologic study in which the student has sufficient background to contribute original thought.


390 FIELD GEOLOGY Su V 9-10 Prereq 130 and c/l. Field work is carried on near Black Hills, Montana. Detailed and regional geologic studies in field. Includes mapping on aerial photographs and topographic base maps, interpretation of geologic structure, and interpretation of geologic phenomena.

FOR UNDERGRADUATES AND GRADUATES

410 INTRODUCTION TO VERTEBRATE PALEONTOLOGY 4 (2-4) Prereq 200 or c/l. Introduction to vertebrate paleontology, vertebrate evolution; comparative laboratory examination of representative fish, amphibians, reptiles, mammals and birds.

410-411 INVERTEBRATE PALEONTOLOGY 4 (2-4) Prereq 102 or 110 and 425. Theory and use of polarizing microscope in identification of non-opaque mineral and non-opaque fossil rocks; formation of invertebrate fossil rocks. Principles of biostatigraphy with examples taken chiefly from the arthropod record. 410 (Vertebrate paleontology) and 411 (Invertebrate paleontology) were formerly designated as Paleontology 410 and 411. 411 principles of biostatigraphy with examples taken chiefly from the molluscan and echinoderm. Labs include paleontologic techniques.

420 *MICROPALAEONTOLOGY 3 (2-2) Prereq 200 or 441. Morphology, classification and biostatigraphic associations of major groups of unicellular and colonial algae. 1,000 species treated.

430 *INTERMEDIATE MINERALOGY 3 (2-2) Geol 445 recommended. Space groups and interpretation of single crystal photographs. Crystal growth. Emphasis on topics in advanced crystal chemistry. Data, infrared spectra, X-rays briefly discussed.

430-435 PETROLOGY/PETROGRAPHY 5 (2-4) Prereq 216, 430. (435) Descriptive and interpretive study in thin section of igneous and metamorphic rocks. (436) Similarly treats metamorphic rocks. Advanced petrologic considerations included in both quarters.
SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREES IN HEALTH AND PHYSICAL EDUCATION

Two degrees are offered in this Department: Bachelor of Arts degree in Physical Education and Bachelor of Science degree in Physical Education. The Bachelor of Science degree is available in 20 areas of specialization. Students desiring a career in teaching must complete 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.

HEPE degree majors: All courses specifically listed in this catalog as requirements for these degrees must be taken on the traditional letter grade basis. This includes courses in HEPE and courses specifically designated in other disciplines.

To remain enrolled in Professional Activities 115-130 and 215-220, students must meet the minimum departmental proficiency level in both skill and knowledge of the activity. Exemption from courses may be allowed for a demonstrated high level of proficiency.

Graduate work. See Graduate School Bulletin. English 100 is required. Students failing to demonstrate an acceptable college standard (score of 17 on the ACT English examination) must first successfully complete English 001. Those who score above 90 on the ACT will be exempt from English 100.

Teacher Certification: Course requirements in Education to meet teacher certifications are listed under Education. Certification is approved for K-12 grades.

Majors planning to teach are urged to refer to the School of Education for those requirements in minor courses, major courses, and major course fields and to strengthen their program by adding to their HEPE major another teaching major or at least a minor. Non-teaching majors, whether participating in a combination of majors or another teaching major or at least a minor, may elect to be graded on pass-fail basis. This includes courses in HEPE and courses specifically designated in other disciplines.

For UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 PHYSICAL EDUCATION ACTIVITIES—Non-Majors in health, physical education, and recreation may include up to but not more than 12 crs. in physical education 100 level activity courses in the total number of credits required for graduation. Beginning level in activity courses may not be repeated for credit. Students may elect to be graded on pass-fail basis.

100 CONCEPTS OF PHYSICAL EDUCATION 1.

115-130 PROFESSIONAL ACTIVITIES FOR MAJORS AND MINORS 1. All students required to meet proficiency entrance standards set by instructor.


199 FIRST AID 2. Red Cross Standard and Advanced courses and Medical Self-Help. Certification secured upon completion of course.

200 (199, 198) HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION 3.

208 ADVANCED COACHING TECHNIQUES 1.

210 COACHING OF FOOTBALL 3.

211 (212) THEORY OF OFFICIATING FOOTBALL 1.

213 COACHING GYMNASTICS 3 prereq 117 (Men), 118 (Women), and c/l.

214 COACHING OF WRESTLING 3 prereq c/l.

215-220 PROFESSIONAL ACTIVITIES FOR MAJORS AND MINORS 1-6. All students required to meet proficiency standards set by instructor.


223 (200) COACHING OF BASEBALL 3.

225 RECREATION OFFICIATING, THEORETICAL AND PRACTICE 1 R-3.

226 OFFICIATING BASKETBALL (Women) 2.

224 DANCE HISTORY 3.


226 THEORY AND PHILOSOPHY OF DANCE 2.

230 WATER SAFETY INSTRUCTOR 2 prereq Red Cross Senior Life and must have attained the age of 18. Certification 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. Prereq to all courses is 12 crs. in Physical Education and ability. Techniques of Teaching Skiing including finishing technical forms, teaching methods, ski school progression, and ski mechanics. Prerequisite: permission of instructor.

261 (361) INTRODUCTION TO RECREATION 3. 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.
1. THEORY OF OFFICIATING BASKETBALL (MEN) 3.

2. COACHING OF TRACK 3.

3. COACHING OF COMPETITIVE SWIMMING 3 prereq c/l.

4. METHODS AND MATERIALS IN BALLROOM, FOLK AND SQUARE DANCE 3 prereq 119.

5. METHODS OF TEACHING MODERN DANCE 2 prereq Modern Dance or =.

6. CREATIVE MOVEMENT FOR CHILDREN 2 prereq Modern Dance background of ages. Experience in planning, observing and directing children's dance.

7. AQUATIC PROGRAM MANAGEMENT 3 prereq Senior Life Saving or =. Methods of teaching swimming for various age groups. Swimming pool and public recreation management.

8. TEACHING PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS 3 prereq PE majors and minors, junior standing, PE 200 and 8 credits in 115-120; elementary education majors, junior standing and Educ 202. Principles and foundations of elementary school physical education, theory and practice in selecting and teaching activities for children in grades one through six.


12. RECREATION LEADERSHIP (SOCIAL RECREATION) 3 prereq HPER 261 and Soc 101. Principles and practice in group leadership, program skills for various age groups and for special groups, methods of quality assurance and the evaluation of the program.

13. RECREATION LEADERSHIP (CAMP LEADERSHIP) 3 prereq HPER 261 and Soc 101. Principles and practice in group leadership of outing activities; skills and understandings essential to organized camping.

14. FIELD WORK IN RECREATION V R-8. Supervisory and leadership experiences, methods and techniques to be used in conducting recreation programs in outdoor recreation, community social agencies and institutional recreation. Opportunity given in various activities. Activities are coordinated to the season and group activities available for leadership training.

15. ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION 3 prereq 200.

16. INTRODUCTION TO PHYSICAL THERAPY 3 prereq or coreq 386. Theory and practice of massage. The treatment of defects which come within the field of physical education.

17. CLINICAL TRAINING IN PHYSICAL THERAPY V 1-4 R-4 prereq 383 and c/l. Practical experience in local physical therapy centers.

18. INSTRUCTOR'S FIRST AID 2 prereq 199. Also open to anyone holding a current advanced First Aid card. Offered summer school only.

19. INSTRUCTORS FIRST AID 3. Red Cross Standard, Advanced and Instructors course and medical self-help, Certification as Instructor level upon completion of course. Credit not allowed for both 199 and 399.

20. SENIOR SEMINAR 1.

FOR UNDERGRADUATES AND GRADUATES

21. ADVANCED TECHNIQUES IN MODERN DANCE 2 prereq Modern Dance I and II.


23. THE HIGH SCHOOL INTRAMURAL PROGRAM 2.


25. APPLIED ANATOMY AND KINESIOLOGY 5 prereq 280-385.

26. PREVENTIVE AND CORRECTIVE PHYSICAL EDUCATION 3 prereq 380. Prevention and detection of common physical defects frequently encountered by the physical educator; follow-up programs possible under medical supervision.

27. MASSAGE 3 prereq Zool 202, HPER 384.

28. AMBULATORY TECHNIQUES FOR THE ORTHOPEDICALLY DISABLED 2 prereq 384.

29. DANCE COMPOSITION AND IMPROVISATION 3 prereq Modern Dance I, II.
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 not only provides teachers, lawyers, journalists, and businessmen, with the base 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 50 credits in History is required. A student may offer a combined major in History and Political Science, English composition requirement must be completed. (English 100) must be completed.

The Department of History requires a foreign language: 3 quarters of a reading sequence in French, Italian, or Spanish, 4 quarters in German, 5 quarters in Russian, Latin, or Greek, or 5 quarters of active skills in any language.

A student may offer a combined major in History and Political Science. A minimum of 50 credits in History and Political Science. 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 100) 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 1500. (105) 1500-1618. (106) 1618 to present. (Credit not allowed for 104 and former 201-202, nor for 105-106 and former 101-102-103.)


261-262-263 UNITED STATES HISTORY 3. Enter either quarter. (261) The American nation from its colonial beginnings to the end of the Civil War. (262) Continuation to the present.


FOR UNDERGRADUATES AND GRADUATES

300 METHODOLOGY 3. Training in the art of researching and writing history.

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, Hellenization and their social, political and economic development to the time of their absorption by Rome.

304 (305) ANCIENT ROME 3. Early Etruscan civilization; Rome as part of Hellenistic culture. The 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 by the western European nations.

309 THE RENAISSANCE 3. The idea of the Renaissance applied to economic, political and cultural developments in Western Europe from 1400 to 1550; the impact on humanistic philosophy.

310 THE REFORMATION 3. The impact of the Reformation on European society, politics, economic theory and religious thought from 1500 to 1600.

311-312-313 EARLY MODERN EUROPE 3. Enter any quarter. (311) European political and cultural development of Europe from 1450 to 1599. (312) 1599 to 1648. (313) 1648 to 1679.

314-315 FRENCH REVOLUTION AND NAPOLEONIC ERA 3 prereq 312 or 313. Enter any quarter. (314) The French Revolution to Napoleon I. (315) Napoleonic conquests, the Napoleonic Empire, and the emergence of nationalism.


319 CONTEMPORARY EUROPEAN HISTORY 4 prereq 313. The internal affairs and the external relationships of the principal European states since 1918.

320 MEDIEVAL GERMANY 911-1250 3. The Frankish experiment and the fall of the Carolingian Empire. The development of German, Italian, Slavic, and Hohenstaufen dynasties with special emphasis on constitutional growth.

321-322 CENTRAL EUROPE 3. Enter any quarter. (321) The development of states of Central Europe from early modern times to 1815. (322) Continuation to the present.

323 SLAVIC WORLD TO 1613 3. Ancient and medieval history of the Slavic Empire, Asia Minor, and the Slavic states as it affects Russia.

324-325-326 HISTORY OF RUSSIA 3. (324) The beginnings of Russia from 862 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) 1871 to 1914. (329) 20th century.


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, intellectual, artistic, social and economic changes in Europe from the reign of Diocletian to the dismantlement of the Carolingian Empire, 284 A.D. to 900 A.D. (337) Continuation from the 10th through the 12th centuries, with the impact of Islam and Byzantium on Western Europe, 1000 to 1300. (338) The 13th to the 15th centuries; the new scientific movement; the decline of the old order in the Middle Ages.

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.

345 ENGLISH CONSTITUTIONAL HISTORY 3 prereq 241-242. English constitutional history from Anglo-Saxon times to the present. Institutional, legal and philosophical changes occasioned by internal and external influence.


351-352 (353) COLONIAL AMERICA 3. (351) The transfer of English civilization to America in the seventeenth century, with attention to the qualities and particular settlements. (352) American civilization from 1689 to the close of the Seven Years War, with focus upon the political, social and economic maturing that prepared the colonies for the revolutionary era.


375-376-377 Recent United States History 3. Enter any quarter. (375) From 1929 to the present. (376) From the end of the Seven Years War, with focus upon the political, social and economic maturing that prepared the colonies for the revolutionary era.


Application of theories and concepts through state and national legislation. The impact of civilization upon the American environment; the uses and consequences of resources (water, mineral, scenic, wildlife, air, etc.) Modes and methods of determining state and national policy.

395-396 (395) NORTH AMERICAN FRONTERAS 3 prereq 292. (396) The French and Indian War, 1754-1763; the British and Indian War, 1763-1774; the American Revolution; the creation of the American nation; the political development of modern America; the North American system of continental states.

397 (397-398) MONTANA AND THE WEST 3. Political, social, economic, and cultural development of Montana, and its relations with the American west.

398 THE TWENTIETH CENTURY WEST 3. A regional history of the trans-Mississippi West since the end of the frontier period.

399-400 (399) DIPLOMATIC HISTORY OF THE UNITED STATES FROM 1815 TO 1914 3 prereq 261, 262. The relations and evolution of an American foreign policy from Washington's time to the close of the Civil War. (400) Continuation from 1866 to 1914. (401) The twentieth century.

402-403 (402) THE BLACK WORLD 3. Typical institutions of Bantu Africa; slavery and the slave trade; the spread of Christianity; the growth of the new fields of scientific endeavor. (403) Interactions between African and Western culture; the growth of the new fields of scientific endeavor.

404-415 (404) THE AMERICAN CONSTITUTIONAL HISTORY 3. The rise of the American System; the concept of national leadership; the development of the United States into a world power.

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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 option 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 is selected as follows:

Required for all majors: Home Economics 109, 153, 241, 246, 265, 309; one English composition and one speech communication course.

The following addition courses are required according to the plan selected by the student.

1. Preparation for Teaching: Home Economics 102, 157, 158 (or 259), 210, 242 (or 342), 302, 303, 308, 310, 318, 365, 382, 391, 481; Microbiology 200, 205; Zoology 202; Education 205. For further requirements consult advisor.

2. Foods and Nutrition and Dietetic Internship: Home Economics 210, 231, 242, 246, 408, 422, 423, 446; Chemistry 121, 122, 261, 262, 481; Microbiology 200, 305; Zoology 202; Education 205. For further requirements consult advisor.

3. Teaching in the Nursery School: Home Economics 102, 242, 304, 307, 309, 310, 314, 367, 408, 498; Chemistry 121; 6 credits of Social Welfare; Education 331; Psychology 230, 240; Sociology 303.

4. General Home Economics: Home Economics 102, 157, 210, 258, 266, 302, 303, 304, 305, 490. Students select option (a) or (b) according to interest and transfer to the major.

(a) Clothing and Textiles emphasis: Home Economics 284, 322, 358, 359, 360, 458; Art 120, 200, 201, 202; Chemistry 109. Students should satisfy the foreign language requirement. Those planning a career in retailing should take Economics 261, 202, 205; Business Administration 360, 362.

(b) Family Relations emphasis: General Home Economics requirements plus Home Economics 310, 346, 367, 490; Anthropology 153; Chemistry 101; Sociology 206, 304, 305; 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 family living in relation to needs of various types of families and to the family life cycle.

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). Courses in financial management, management in applying resources to obtain satisfaction for individuals and families.

141 ELEMENTARY FOODS 3 (2-2). The selection, preparation, and evaluation 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.

158 TEXTILE SELECTION 3 (2-2). Fabrics for family clothing and home furnishings. Analysis of fibers, yarns, weaves and finishes.

159 INTRODUCTORY CLOTHING 2 (2-0). Aesthetic and economic factors in the selection of clothing. Principles of clothing construction.

158 CLOTHING LABORATORY 2 (0-4) prereq or coreq 157. Basic principles applied to planning and making garments. Designed 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, preparation, and presentation of food. Methods of food conservation. Majors and minors only. Credit not allowed for both 141 and 241.

242 FOOD PREPARATION LAB 2 (0-4) 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 8.

266 CHILD DEVELOPMENT II 3 (3-0) prereq Psych 110. The child from 8-14 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 302. Art principles applied to Interior Decoration to create attractive, efficient backgrounds for living. A study of outstanding period styles and contemporary designs; and designers, plus qualities to consider in selecting 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 (2-4) 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, 241. Application of principles of food preparation and food management to institutional situations. Menu planning for institutions.
### HUMANITIES, INDIAN STUDIES, JOURNALISM—53

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

The candidate for the degree of Bachelor of Arts in Journalism must complete the recommended core curriculum of 32 hours, plus the requirements of his sequence, plus upper-class electives for a minimum of 48 hours in Journalism. The core curriculum in Journalism, required of all majors, consists of Journalism 100, 150, 270, 290, 360, 361, 372, 390, 391, 491-492-493. Three quarters of a foreign language are required.

#### CURRICULUM IN JOURNALISM

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journ 190—Social Role of the Mass Media</td>
<td>3</td>
</tr>
<tr>
<td>Electives and courses in allied fields</td>
<td>39-46</td>
</tr>
<tr>
<td></td>
<td>45-52</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>Journ 270—Reporting</td>
<td>3</td>
</tr>
<tr>
<td>Electives and courses in allied fields</td>
<td>39-50</td>
</tr>
<tr>
<td></td>
<td>45-56</td>
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</tbody>
</table>

**Junior and Senior Years**

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>Journ 360—Principles of Advertising</td>
<td>3</td>
</tr>
<tr>
<td>Journ 361—Advertising Sales</td>
<td>3</td>
</tr>
<tr>
<td>Journ 371—Advanced Reporting</td>
<td>2</td>
</tr>
<tr>
<td>Journ 372—Specialized Reporting</td>
<td>2</td>
</tr>
<tr>
<td>Journ 390—News Editing</td>
<td>3</td>
</tr>
<tr>
<td>Journ 381—Advanced News Editing</td>
<td>2</td>
</tr>
<tr>
<td>Journ 491-492-493—Senior Seminar</td>
<td>6</td>
</tr>
<tr>
<td>Journ Electives (including sequence requirements)</td>
<td>15-20</td>
</tr>
<tr>
<td>Additional electives and courses in allied fields</td>
<td>67-20</td>
</tr>
</tbody>
</table>

Total recommended hours in Journalism 185

Total recommended hours in General Education 147

### JOURNALISM CURRICULUM

**NEWS-EDITORIAL SEQUENCE:** Additional 9 hours required to be chosen from Journalism 237, 290, 297, 470, 495.

**ADVERTISING SEQUENCE:** Additional 9 hours required to be chosen from Radio-Television 348; Journalism 362, 363, 364.

**MAGAZINE SEQUENCE:** Additional 9 hours required to be chosen from Journalism 237, 322, 353, 354.

**RADIO-TELEVISION SEQUENCE:** An additional 9 hours required to be chosen from Radio-Television 341-342-343, 346, 441-442-443.

**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)

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 SOCIAL ROLE OF MASS MEDIA 3</td>
<td>Open to non-majors.</td>
</tr>
<tr>
<td>150 ELEMENTS OF WRITING 3</td>
<td></td>
</tr>
<tr>
<td>196 CURRENT AFFAIRS 1</td>
<td>Open to non-majors.</td>
</tr>
<tr>
<td>227 ELEMENTARY PHOTOGRAPHY 3</td>
<td>prereq c/l. Open to non-majors.</td>
</tr>
<tr>
<td>270 REPORTING 3</td>
<td>Open to non-majors.</td>
</tr>
<tr>
<td>290 HISTORY AND PRINCIPLES OF JOURNALISM</td>
<td>Open to non-majors.</td>
</tr>
<tr>
<td>327 NEWS PHOTOGRAPHY 3</td>
<td>prereq 227.</td>
</tr>
<tr>
<td>332 MAGAZINE MAKEUP AND EDITING 3</td>
<td>prereq c/l. Open to non-majors.</td>
</tr>
<tr>
<td>333 MAGAZINE ARTICLE WRITING 3</td>
<td>prereq c/l. Open to non-majors.</td>
</tr>
</tbody>
</table>

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### FOR GRADUATES

699 THESIS V R-15.
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.

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 turn to teaching in the University (such as taxation) at eastern institutions; graduates with the requisite scholarship standing are readily accepted by other law schools specializing in more advanced legal education.

There are a few law schools specializing in the practice of law in many large cities of the United States.

CALENDAR

FALL SEMESTER 1971

September 20, Monday ____________________________ Registration
September 20-21, Monday-Tuesday _______________ Orientation of new students
September 22, Wednesday _________________________ Classes begin at 8 a.m.
October 19, Monday _______________ Columbus Day, no classes
October 25, Monday _______________ Veterans Day, no classes
November 23, Tuesday _______________ Thanksgiving vacation begins after last class
November 29, Monday __________________________ Classes resume at 8 a.m.
December 16, Saturday _______________ Christmas vacation begins after last class
January 3, 1972, Monday __________________________ Classes resume at 8 a.m.
January 20, Thursday ____________________________ Last day of classes
January 24-29, Monday-Saturday ________________ Semester examinations

SPRING SEMESTER 1972

February 8, Tuesday ____________________________ Registration
February 9, Wednesday __________________________ Classes begin at 8 a.m.
February 12, Saturday __________________________ Lincoln's Birthday, no classes
February 15, Monday ____________________________ Washington's Birthday, no classes
March 27, Monday ______________________________ Classes begin at 8 a.m.
May 25, Thursday ______________________________ Last day of classes
May 29-June 3, Monday-Saturday ________________ Semester examinations
June 3-7, Monday-Friday __________________________ Final examinations

GENERAL STATEMENT: The Law School is accredited by the American Bar Association and the Association of American Law Schools. Organization of instruction is upon the semester basis, the school year being divided into two semesters of approximately eighteen weeks each, including vacation periods. For detailed information concerning facility descriptions, faculty, 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 degree from an accredited college or university prior to matriculation in the Law School. Non-degree causes are not acceptable except for required courses in physical education to the extent of ten percent of the total credits offered for admission.

Applicants with undergraduate degrees from the University of Montana must have taken English 450 (Advanced English Composition) and received a grade of "C" or better. Applicants having degrees from other institutions must have completed, with a grade of "C" or better, an equivalent course or must achieve a satisfactory score on an examination required by the Law School in the proficient use of English. All applicants who fail the examination may be admitted on probation, but must take English 450 during the first semester of Law School and achieve a grade of "C" or better as a condition to being permitted to register for the second semester. The Law School faculty reserves the right to require any student to take further work in study in English Composition at any time that he evidences a deficiency.

College credit in the principles of financial accounting is also required for admission. Normally two quarters or two semesters of accounting are necessary to fulfill this requirement.

The Law School Admission Test is required of all applicants for admission to the Law School. It should be taken during the year preceding the one for which admission is sought. Information concerning the test and application forms may be obtained from the School of Law or from the Educational Testing Service, P. O. Box 944, Princeton, New Jersey 08540.

Special students are not admitted to the Law School. Students otherwise qualified for admission may register for selected courses in law with the approval of the Dean of the Law School and the instructor of the course.

All applications for admission to the Law School must be submitted before June 1 of the year in which entrance is contemplated. In addition to the credentials required by the Registrar of the University, the applicant must submit to the Law School (a) an official transcript of all college and law school work previously undertaken; (b) a verified questionnaire, on a form prescribed by the Law School, dealing with the moral character and fitness of the applicant as a prospective member of the legal profession; (c) a report of his grade on the Law School Admission Test.

A fee of $20.00 must be paid at the time of making application. No refunds will be made, but upon matriculation, the student enters the semester indicated on the application for admission, and this fee will be credited as the law student activity fee.

ADMISSION TO ADVANCED STANDING: Applicants for admission to the Law School with advanced standing must satisfy the requirements for admission to the Law School and show: (1) that 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 standing and has been an eligible student in the law school previously attended; and (4) that the applicant is eligible to continue in this Law School, as the policies specified herein. An applicant is not likely to be admitted 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 10 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 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 in a repeated course will not replace the previous 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 readmitted, except in extraordinary cases when a satisfactory showing is made to the faculty, by written petition, or regular class attendance.

REQUIREMENTS FOR GRADUATION: Candidates for the degree of Juris Doctor (J.D.) must: (1) be graduates of an approved college or university; (2) complete the six semesters in law school at the University of Montana; (3) complete ninety semester hours of law with an index of 2.0 in all law courses for which the student has registered and received a grade; and (4) complete the following required courses: (a) Civil Law; (b) Constitutional Law; (c) Legal Procedure; (d) Evidence; (e) Legal Aid, and one Seminar each semester. Credit is earned by the successful writing of a final examination except in practical skills programs, or on the recommendations of the Law School.

Any student who has completed two semesters of law study but has less than a 3.0 scholastic index on law grades earned at the University of Montana, or fails to maintain such an index thereafter shall be excluded from the Law School. Any student who is not recommended by the Law School for graduation will not be admitted to the bar.

A candidate for the degree of Juris Doctor who has fulfilled the requirements for graduation will be recommended for the degree if, in the opinion of the majority of the law faculty, he is unqualified 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.

LIBERAL ARTS

Programs are offered as surveys or introductions to broad fields of learning and are primarily interdisciplinary in scope. Included are courses in Humanities, Black Studies, and Indian Studies.

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.

150 (151) CLASSICAL MYTHOLOGY. (See Foreign Languages.)

230 (221) FOREIGN LITERATURES IN TRANSLATION. (See Foreign Languages.)

541 THE FILM. 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.)

531 STUDIES IN HUMANITIES 3 R-9 prereq Gen 151-152-153. Advanced studies in Humanities. Given by different instructors under various titles.

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 3 or through the School of Comparative Literature. 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.

BLACK STUDIES FOR UNDERGRADUATES


366 THE BLACK RENAISSANCE 3 prereq any two of the 200 level courses. A study of the artistic and cultural renaissance in the 19th and early 20th centuries and its contributions and effects upon the resurgence of black identity today.

367 URBAN AFFAIRS 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.


INDIAN STUDIES FOR UNDERGRADUATES


231 THE RESERVATION INDIAN 3 prereq 230 or c/s. Study of the Reservation Indian with special emphasis on the Montana Indian.

232 THE URBAN INDIAN 3 prereq 230 or c/s. Study of the Urban Indian with special emphasis on the Montana Indians.

233 HISTORY OF INDIAN AFFAIRS 3 prereq 230 or c/s. Survey of relationship between the American Indian and the State and Federal Government.

490 INDEPENDENT STUDY prereq senior standing or c/s 1-9 (R). Selected topics on Indians conducted under the guidance of a staff member. Term papers may be required.
LIBERAL ARTS DEGREE PROGRAM

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. A faculty committee, chaired by the Dean of the College of Arts and Sciences, will advise those students who elect to major in Liberal Arts.

This program permits the student to work in a combination of the above fields rather than in any one of them, if he chooses, 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 department should have completed, however, English 300 when this course was attempted. The liberal arts curriculum is not designed for the student who is undecided as to his major.

Majors in Liberal Arts may not take any of their major courses on a Pass/Fail/Not Passed basis.

Following are the special requirements for the Bachelor of Arts degree with a major in Liberal Arts:

MAJOR REQUIREMENTS (courses under 300)

1. English 100........................................ 15
2. Foreign Languages........................15 minimum
3. 380-391-392-393.......................... 9
4. Humanities 151-152-153.............. 9
5. Anthropology, Economics, Geography, Psychology (any two).................. 15
6. History or Political Science or both (History 155-156-157 or 152-153-154 recommended)..... 15
7. Literature (English 211-212-213 and 231-232-233 recommended)........... 12
8. Philosophy (Philosophy 299-399-300 recommended)................ 10

MAJOR REQUIREMENTS (courses 300 and above)

In two of the following three fields the student elects upper division courses equal to the number of credits indicated for those fields:

9. Anthropology, Economics, Geography, Sociology (any two)............. 24
10. History or Political Science or both........................................... 24
11. Literature or Philosophy or Humanities 351 and 352 and 353 or any combination of the three recommended... 48
12. Elective credits to bring the total to 195 ................................ 195

MATHMATICS

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 is evidenced by the fact that mathematical ideas—true or conjectured—have been greater than at the present time, and, accordingly, the need for well-trained, competent mathematicians has never been greater than at the present time. This is indicated, in part, 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 year or two of high school algebra. (Not offered after 1971-72 academic year.)

117 TRIGONOMETRY 5 prereq 116 or exemption by examination or 2 years of high school algebra. Trigonometric functions and their graphs, Pythagorean identities, addition formulas, laws of sines, cosines, and tangents, exponential and logarithmic functions and their graphs, solution or triangulation.

118 INTRODUCTION TO CALCULUS 5 prereq 117, or exemption by examination or 2 years of high school algebra. Ideas of elementary functions, limit, continuity, convergence, differentiation, and integration of functions of one real variable, applications. (Not offered after 1971-72 academic year.)

121 ELEMENTARY FUNCTIONS 5 prereq 001 or exemption by examination or two years of high school algebra. Functions of polynomials, rational, exponential, and logarithmic functions, and inverse functions. Functions of one variable. (Not offered after 1971-72 academic year.)

125 STATISTICS 5 prereq 001 or exemption by examination or two years of high school algebra. Probability models, statistical independence, sampling, tests of statistical hypotheses.

130 THEORY OF ARITHMETIC 5 prereq 001 or exemption by examination or two years of high school algebra. The mathematical meaning and background of arithmetic. (For education majors.)

151-152 CALCULUS I-II 5 prereq 121 or 117 or exemption by examination or two years of high school algebra. The calculus including trigonometry. Limits, continuity, differentiation, and integration of functions of one variable, applications. 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 levels.

200 INTUITIVE GEOMETRY 4 prereq 130 or c/l. Axiom system of the essentials of Euclidean plane geometry, and selected topics. (For education majors.)

251 CALCULUS III 5 prereq 153. Partial differentiation, multiple integrals, line and surface integrals, 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 method is included. Course is intended primarily for those enrolled in secondary school.

271-272-273 COMPUTING AND MATHEMATICS 3 (3-4) prereq Math 001 and c/i. The elements of linear equations, inequalities; calculus of one and two variables, including basic computer language and the use of a mini-computer. (271) Linear equations and inequalities, linear 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 MATHEMATICS FOR TEACHERS 3 prereq 153. An axiomatic treatment of a construction of the real number system. The theory of algebraic equations with consideration for the secondary school level, including the geometric transformations as they apply to the secondary school.

305 TOPICS IN MATHEMATICS V prereq 1 year experience in teaching high school mathematics. The main purpose of this course is to help high school mathematics teachers extend their study of mathematics. Content varied to meet the needs of the student. (Credit not allowed toward a degree in Mathematics.)


307 FOUNDATIONS OF MATHEMATICS 4 prereq 20 credits in mathematics. Axiom systems, logic, set theory, cardinal numbers, propositions equivalent to the axiom of choice, paradoxes and the avoidance of paradoxes, and selected topics. (301) Algebraic systems, linear algebra, matrices, vector analysis, topology, continuity, connectedness, compactness, and selected topics. Assigned work on the digital computer. (Credit not allowed for this course and Computer Science 301-302-303.)

310 MATRIX ALGEBRA 4 prereq 153. Introduction to and use of eigenvalues and eigenvectors. Use of various canonical forms of matrices for solution of systems of linear equations and an introduction to linear programming. (Credit not allowed for this course and Computer Science 310-311-312.)


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.

327-328 (315-316) 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 327. 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.)

338 (389) INTRODUCTION TO GENERAL TOPOLOGY 4 prereq 358 or 379. Topological spaces, convergence, separation axioms, metric spaces, (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

340-341-342-343 MATHEMATICAL STATISTICS 3 prereq 252 and c/i. Development of necessary mathematical concepts, probability, random variables and distribution functions, sampling, testing hypotheses, confidence intervals. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

344-345-346 (302-303) STATISTICAL METHODS 3 prereq 153 or c/i. Probability theory is studied as a model for random phenomena, the foundations of statistical inference, sampling, design and analysis of experiments. (Credit not allowed for this course and Computer Science 344-345-346.)

347-348-349 (357-358) STATISTICAL METHODS 3 prereq 252 and c/i. Probability theory is studied as a model of random events in spaces, the algebra of events, expectations, the weak law of large numbers and the central limit theorem, theorems about statistical inference. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

357-358 (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 338. A topic in advanced analysis is studied in appropriate depth. Possible topics include infinite series, Fourier series, metric spaces, and multidimensional calculus. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

367 COMPLEX ANALYSIS 4 prereq 358. Complex numbers, analytic functions, Cauchy integral theorem and functions, the theory of residues, solutions, methods of solution, and applications of ordinary 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 367-368-369.)

371-372-373 NUMBER THEORY 3 prereq 358. The study of integers. Topics include congruences, diophantine equations, and the distribution of prime numbers. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

399 SEMINAR V R-15 prereq c/i. Guidance in special work for advanced students.


441-442-443 ADVANCED STATISTICS 3 prereq 345, 352, 421. Multidimensional normal distribution, methods of statistical inference. Design of experiments, tests of hypotheses, non-parametric statistics and other topics chosen to fill the needs of the student.

452-453-454 MODERN ADVANCED CALCULUS 3 prereq 252 or c/i. Set theory, real number system, metric spaces, normed linear space, applications to differential equations, functions of several variables, inverse function theorem, integration and Stokes' theorem.


471-472-473 NUMERICAL ANALYSIS 4 (3-4) prereq 252 and 249 for 471, 250 recommended: c/i for 472 and 473. Error analysis; approximation; numerical solution of linear and non-linear 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 371-372-373 or 471-472-473.

511-512-513 ADVANCED MATHEMATICAL METHODS 3 prereq 413 or c/i. Theory of approximate solutions to equations including Steepest descent, 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.

523 THEORY OF FIELDS 3 prereq 423. Algebraic and transcendental extensions. Topics from Galois theory, algebraic functions, and/or ordered fields.

529 STRUCTURE OF RINGS 3 prereq 423. Radicals and the Wedderburn theorem. Group rings, tensor products, and selected topics.

532 COMMUTATIVE RINGS 3 prereq 433. Noetherian rings, integral domains, integral extensions, and related topics.

551-552-553 TOPOLOGY 3 prereq 353. Set theory, topological spaces, metrizability, continuous mappings, topological mappings, and selected topics.

551-552-553 REAL ANALYSIS 3 prereq 453. Lebesgue measure and integration, Lp-spaces, elementary point set topology, metric spaces, and selected topics.


MATHMATICS—57

381 (329) EUCLIDEAN GEOMETRY 3 prereq 153, Geometry from an axiomatic point of view, Hilbert's axioms, models of axioms systems, introduction to non-Euclidean geometries.

382 (322) NON-EUCLIDEAN GEOMETRY 3 prereq 153. A short history of geometry, Bolyai-Labatchevsky geometry, projective geometry, finite projective geometry.
561-563 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, Hilbert-Schmidt operators, Riesz operators, differential operators, invariant subspaces.

564-565-566 SPECTRAL THEORY 3 prereq 563. Spectral representation, spectral resolution, Hilbert-Schmidt operators, weak topologies, continuous linear operators, elementary spectral theory.

600 GRADUATE SEMINAR V prereq c/i. This course provides guidance in graduate subjects on research work.

610 GRADUATE SEMINAR IN APPLIED MATHEMATICS V prereq c/i.

620 GRADUATE SEMINAR IN ALGEBRA V prereq c/i.

630 GRADUATE SEMINAR IN TOPOLOGY V prereq c/i.

640 GRADUATE SEMINAR IN PROBABILITY AND STATISTICS V prereq c/i.

650 GRADUATE SEMINAR IN ANALYSIS V prereq c/i.

660 GRADUATE SEMINAR IN FUNCTIONAL ANALYSIS V prereq c/i.

670 GRADUATE SEMINAR IN NUMERICAL ANALYSIS V prereq c/i.

680 GRADUATE SEMINAR IN GEOMETRY V prereq c/i.

699 THESIS V R-15.

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 biology 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 the internship, the student receives a diploma 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 many laboratories as 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 3½ years of academic studies 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 for the degree in Medical Technology: Microbiology 111, 200, 201, 202, 310, 406, 411, 415, 420; Physics 111-112-113; Zoology 111-112-113, 201, 202, 313; Chemistry 121-122-123, 134-135-136, 245-246, 211-212, 214-215; Mathematics 107-108-109; English 100 and 450. A minimum total of 48 credits from Microbiology courses listed above and from the following courses is required: Microbiology 306, 207, 404, 405, 407, 418, 419, 430; Chemistry 481-482, 485-486, 370-378 are recommended. Substitutions may be approved by the chairman of the Department of Microbiology.

SUGGESTED CURRICULUM

Option I

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Chem 121-122-123—College Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 124-125-126—College Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Zool 111-112-113—Introduction to Biology</td>
<td>2</td>
</tr>
<tr>
<td>General Zoology</td>
<td>5</td>
</tr>
<tr>
<td>Micro 415—Medical Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>Math 107-108-109—Mathematics for Biological Sciences</td>
<td>5</td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 211-212—Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 214-215—Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>Chem 245—Quantitative Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Chem 246—Quantitative Analysis Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Micro 200—General Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>Micro 201—General Microbiology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>English 100—Composition</td>
<td>3</td>
</tr>
<tr>
<td>Zoology 302—Human Physiology</td>
<td>5</td>
</tr>
</tbody>
</table>

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 111-112-113—General Physics</td>
<td>5</td>
</tr>
<tr>
<td>Micro 305—Medical Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>Micro 310—Immunology and Serology</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 313—Vertebrate Histology</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 304—Comparative Vertebrate Anatomy</td>
<td>5</td>
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</tbody>
</table>

Senior Year

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro 406—Clinical Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>Micro 404—Molecular Genetics</td>
<td>5</td>
</tr>
<tr>
<td>Micro 420—Virology</td>
<td>5</td>
</tr>
<tr>
<td>Micro 405—Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Microbiology is the study of microorganisms, including the bacteria, yeasts, molds, rickettsias, 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 that 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.)

HIGHSCHOOL PREPARATION. In addition to the general requirements for admission to the University, it is recommended that high school preparation includes Algebra, Geometry, Trigonometry, Chemistry, Physical Science, and a foreign language.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MICROBIOLOGY. In addition to the general requirements listed earlier in the catalog, the following courses must be completed for the Bachelor of Arts degree in Microbiology: Microbiology 111, 200, 201, 202, 310, 350, 404, 405, 411, 415, 420; Zoology 111-112-113; Chemistry 121-122-123, 124-125-126, 245-246, 211-212, 214-215; Physics 111-112-115; Mathematics 107-108-109; English 100 and 450. Chemistry 306, 450-482, 478 are recommended. A minimum of 45 credits in the major field is required to receive a bachelor's degree. This requirement may be satisfied by successful completion of Microbiology courses listed above and any of the following courses: Microbiology 306, 307, 406, 407, 418, 419, 430 or any other courses approved by the chairman of the Department of Microbiology. Substitutions may be approved by the chairman of the Department of Microbiology.

Candidates for the Bachelor of Arts degree in Microbiology must demonstrate a working knowledge in a single foreign language. This working knowledge should be equivalent to at least one year of college-level foreign language. There are several different ways to fulfill this requirement. Students contemplating graduate work are advised to take an additional foreign language.

<table>
<thead>
<tr>
<th>SUGGESTED CURRICULUM</th>
<th>Freshman Year</th>
<th>Sophomore Year</th>
<th>Junior Year</th>
<th>Senior Year</th>
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<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>W</strong></td>
<td><strong>Cr.</strong></td>
<td><strong>A</strong></td>
<td><strong>W</strong></td>
</tr>
<tr>
<td>Chem 121-122-123—College Chemistry</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Chem 124-125—College Chemistry Laboratory</td>
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<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Zoology 111-112-113—Introduction to Biology, General Zoology</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Microbiology 111—Survey of Microbiology</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Math 107-108-109—Mathematics for Biological Sciences</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td><strong>2</strong></td>
<td><strong>4</strong></td>
<td><strong>2</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

**FOR UNDERGRADUATES**

For Explanation see Course Descriptions (Index)

100 ELEMENTARY MICROBIOLOGY 3 (3-0). The structure, function, and classification of bacteria, molds, yeasts, rickettsiae, and viruses, and their clinical significance. Food, drug, and fermentation and other industries. (Not allowed toward a major in microbiology.) (Students enrolling in Microb 100 are strongly urged to enroll also in Microb 101—Elementary Microbiology Laboratory—which will strengthen their understanding of microbiological concepts.)

101 ELEMENTARY MICROBIOLOGY LABORATORY 2 (0-4) prereq or coreq 100. 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 (3-0). Infectious 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)

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, food and other industries. (Credit not allowed for both 100 and 200.)

201 ELEMENTARY MICROBIOLOGY LABORATORY 2 (0-4) prereq 200. Experiments in general microbiology. (Not allowed toward a major in microbiology.)

202 MEDICAL MICROBIOLOGY 5 (3-4) prereq 200 or =. The pathogenic microorganisms; clinical, therapeutic and diagnostic aspects of the diseases they produce in man.

206 APPLIED MICROBIOLOGY 5 (3-4) prereq 200 or 100. Principles of food, water, sewage and soil microbiology.

301 ENVIRONMENTAL HEALTH 3 (3-0). Environmental health as related to public health: living and working environments; water, food and air sanitation; and sanitary disposal of liquid and solid wastes.

310 IMMUNOLOGY AND SEROLOGY 5 (2-4) 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 C/I. 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.


407 CLINICAL MICROBIOLOGY LABORATORY 2 (0-4) prereq or coreq 406 or Chem 384 or 481 or Zoology 340. Clinical diagnostic methods.

411 EPIDEMIOLOGY 3 (3-0) prereq 302. Distribution and frequency of disease; factors affecting its spread and control.

415 MEDICAL MYCOLOGY 5 (3-4) prereq 302. Morphology, physiology, infectivity and immunogenicity of fungi pathogenic for man.

418 YEASTS 3 (3-0) a/y prereq 350. The classification, cytology, composition, genetics, metabolism, growth and significance of the yeasts.

419 MYCOPLASMA AND L-FORMS 2 (2-0) a/y prereq 302. Physiology, immunology, pathogenesis, taxonomy, and interrelationships of microorganisms lacking cell walls, including Mycoplasma (FP0 and FPLO), 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, animal viruses and rickettsiae.

430 SPECIAL PROBLEMS IN MICROBIOLOGY V 1-5 R-15 prereq 200, 203 and 3-0 average in biological sciences. Independent research.

488 POPULATION AND ECOLOGICAL GENETICS 5 (5-0) prereq 350 or equivalent. Genetic structure of populations. Dynamics of natural selection and adaptation. Same as Botany and Zoology 488.

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 (0-0) R-9.


500 ADVANCED VIROLOGY V 3-5 (3-5) prerequisite 420 or Bot 237. Relationships of animal viruses to infectious diseases; tumor induction by viruses; molecular level of viral replication.

510 ADVANCED MICROBIOLOGICAL PHYSIOLOGY V 3-5 (3-5) prerequisite 588. The various metabolic pathways found in microorganisms, with special emphasis on the isolation, structure, function, synthesis, and control of macromolecules.

511 IMMUNOCHEMISTRY 5 (2-6) prerequisite 310, Chem 481-482, 485-486. Chemistry of detection of antigens and antibodies and their reactions. Laboratory emphasizes independent studies on selected aspects of immunochemistry.

580 MOLECULAR BIOLOGY SEMINAR 1 R 1-0 (1-0). Also listed as Bot 580 and Chemistry 580.

600 RESEARCH V R-25 prerequisite 1 quarter of residence and full graduate standing.

685-689-697 ADVANCED MOLECULAR BIOLOGY LABORATORY I-3 prerequisite 485 or c/o. 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 course offerings 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, conspicuous achievement in music, promise of development, and in scholarship in general, than it is in the precise content of the program which the prospective music student has followed prior to admission to college. The Music Department welcomes the opportunity to advise with students and parents during the high school period by correspondence or by interviews on the campus. Every student who wishes to become a music major must audition for placement during Orientation week.

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 music majors 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 ( these 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. Passing or withdrawing from this requirement, by the election of Music 140 or 106-110. Exceptions to this requirement may be made only by the Music faculty.

6. All candidates for the Bachelor of Music or Music Education degree must satisfactorily demonstrate, through examination by the piano staff, functional knowledge of the piano normally achieved through completion of Piano in Class 217 or equivalent. Elementary Music majors (Curriculum A-1) must complete 4 credits of Piano 100.

7. Outstanding seniors in Curriculum A or C may give one-half recital only. Students whose curriculum requires a full recital (Curriculum B) may satisfy this requirement by giving two half-recitals.

8. All candidates for the B.M.E., B.M., or B.A. degree enrolled in Music 201 or 401 may be required for Band and winter quarters. All freshmen registered in Music 201 shall take a divisional jury at the end of the spring quarter 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 the spring or other quarters. If to be exercised said option to be noted at the beginning of spring quarter. Students may be excused from division juries by the music department (a graduate in that quarter or (b) they have played a half or full recital in that 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) Evaluation of academic record for satisfactory completion of 213, 239 (including proficiency examination), 236, 217, 211, 510, 508, 366, 310, 821, 218, 216, 215, 214, 212, 211, 518, (including piano functional examination), and sixth 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 shall 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 or more half-hour lessons per week: $15.00
Three half-hour lessons per week: $20.00

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 $7.65 per lesson will 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 $8.00 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 experiences with vocal 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 preparatory to teaching and directing special and general music classes in the elementary grades (K-8).

Music course requirements for Curriculum A (Elementary) shall include a total of:

201 (Piano or voice), 6 cr.;
401, 1 cr.;
100 (Piano or voice), 4 cr.;
103, 3 cr.;
106-110 or 140 (with faculty approval), 3 (including the final or senior II: a final oral and/or written examination).

Aural Perception I, 2 cr.;
Aural Perception II, 2 cr.;
125, 2 cr.;
120, 2 cr.;
135, 2 cr.;
322, 3 cr.;
301, 3 cr.;
256 and 286, 6 cr.;
334, 335, 336, 337,
11 cr.;
320, 3 cr.

In cases of a demonstrated proficiency in piano or voice other study may be substituted with the approval of the music faculty.
Non-music requirements shall include the following: English, 9 cr (to include English 100, 6 cr); Psychology 110, 5 cr; General 121-23, 2 cr; Special 82-86, 3 cr; Mathematics 120 and 220, 9 cr; General 123-67, 15 cr. Electives will be presented to complete a total of 62 credits.

Professional courses totaling 34 credits shall include the following:

- Education 200, 2 cr (Education 201-202, 1 cr, and Drama 101, 3 cr, and Education 401, 15 cr, and Education 406, 3 cr, and Education 347, 3 cr, and HPER 237, 2 cr).

It is recommended that elementary teachers take HPER 116, Modern Dance, 1 cr; and HPER 327 Children's Dance Laboratory, 2 cr.

Suggested Freshman Program: Music 201, Theory I, Aural Perception I, Introduction to Music Literature, 3 cr; English 100, 4 cr; English 106, 1 cr; Psychology 110; Music 102; upper division music electives, 6 cr.

(2) with a major in Choral and Instrumental Conducting and Music Administration; training and background for conducting in instrumental and choral groups, and administering a Secondary School Music Department (K-12).

Music course requirements for Curriculum A-2 shall include a total of 60 credits as follows: Music 100, 4 cr; English 106, 1 cr; Psychology 110; Music 102 and 104, 5 cr; 106-110 or 110, 11 cr (divided and applied to major and minor); Theory I, 6 cr; Theory II, 6 cr; Aural Perception I, 6 cr.; Aural Perception II, 6 cr.; Piano in Class, 6 cr.; Voice in Class, 3 cr.; Strings in Class, 3 cr.; 128, 129, 130, 6 cr.; 135, 4 cr.; Music History, 9 cr.; Music Theory I, 6 cr.; Piano, 6 cr.; Voice in Class, 3 cr.; Strings in Class, 3 cr.; Instruments in Class (125-6-7 and 128-29-30), 15 cr.; English, 15 cr.; General 125-6-7, 15 cr.; Electives will include 9 er. in English.

Exceptions: Students taking piano as Performance Major will not take 6 credits of Voice in Class and those with Voice as Performance Major will not take the 5 credits of Voice in Class, reducing the required non-music elective credits accordingly. Students wishing to complete an academic minor in music need not complete the 6 credits in upper division music electives, 6 cr.

Non-music requirements include a minimum of 77 credits including English, 9 cr (to include English 100, 6 cr); Psychology 110, 5 cr; Education 200, 205, 305, 405, 407, 24 cr.

Students taking piano as Performance Major must complete Music 320, 321, Piano Methods and Materials.

Suggested Freshman Program: Music 201, Theory I, Aural Perception I, Introduction to Music Literature; English 100; upper division music electives, 6 cr.

(3) with a major in Choral Conducting; training and background for conducting Secondary School choral groups, and assisting in General Music programs (K-12).

Majors in this curriculum follow Curriculum A-2 with the following exceptions and alterations in the music course requirements: 201, 6 cr; 401, 6 cr (piano or voice); 100, 9 cr (piano or voice with credits for Text, 4 cr, in Class and those with Voice as Performance Major will not take the 5 credits of Voice in Class, reducing the required non-music elective credits accordingly. Students wishing to complete an academic minor in music need not complete the 6 credits in upper division music electives, 6 cr.

Piano or Voice in Class may be deleted according to area of performance major and minor. An academic teaching minor is recommended.

(4) with a major in Instrumental Conducting; training and background for conducting Secondary School instrumental groups, and beginning instrumental groups (K-12).

Majors in this curriculum follow Curriculum A-2 with the following exceptions and alterations in the music course requirements: 401, 6 cr; 100, 9 cr. (piano or voice in Class and those with Voice as Performance Major will not take the 5 credits of Voice in Class, reducing the required non-music elective credits accordingly. Students wishing to complete an academic minor in music need not complete the 6 credits in upper division music electives, 6 cr.

Piano in Class may be deleted according to area of performance major and minor. An academic teaching minor is recommended.

Double majors are possible in curriculum A-2 with the following exceptions: (1) at least six credits in Music 140 (Piano Ensemble) must be included; (2) a half recital, Music 445, 1 credit, will fulfill the senior recital requirement. Organ majors may substitute 6 credits of upper division music elective for Piano Methods.

Non-music requirements include a minimum of 59 credits, including 9 cr. in English, to include English 100.

Suggested Freshman Program: Music 201, 106-110 or 107; Theory I, Aural Perception I, Introduction to Music Literature, 3 cr; English 100; Academic Electives, 13 credits.

MAJOR IN VOICE

Music course requirements for Curriculum B with Major in Voice shall include a total of 121 credits as follows: Music 100, 2 cr; English 106, 3 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 6 cr.; Aural Perception II, 6 cr.; Piano in Class, 6 cr.; Voice in Class, 3 cr.; Strings in Class, 3 cr.; Instruments in Class, 128-29-30, 15 cr.; English, 15 cr.; General 125-6-7, 15 cr.; Electives will include 9 er. in English.

Non-music requirements include a minimum of 59 credits, including 9 cr. in English, to include English 100.

Suggested Freshman Program: Music 201, 106 or 107; Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature, 3 cr; English 100; 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: Music 100, 2 cr; English 106, 3 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 6 cr.; Aural Perception II, 6 cr.; Piano in Class, 6 cr.; Voice in Class, 3 cr.; Strings in Class, 3 cr.; Instruments in Class, 128-29-30, 15 cr.; English, 15 cr.; General 125-6-7, 15 cr.; Electives will include 9 er. in English.

Non-music requirements include a minimum of 59 credits, including 9 cr. in English, to include English 100.

Suggested Freshman Program: Music 201, Band or Orchestra, Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature, 3 cr; English 100; 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: Music 100, 2 cr; English 106, 3 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 6 cr.; Aural Perception II, 6 cr.; Piano in Class, 6 cr.; Voice in Class, 3 cr.; Strings in Class, 3 cr.; Instruments in Class, 128-29-30, 15 cr.; English, 15 cr.; General 125-6-7, 15 cr.; Electives will include 9 er. in English.

Non-music requirements include a minimum of 60 credits, including 9 cr. in English, to include English 100.

ADDITIONAL REQUIREMENTS: Students taking voice or instrument in the Music 201-401 series, must take Music 100 (Piano) until a jury examination demonstrates adequate proficiency.

Theory Majors are not required to take Music 359, and Music 459.

Composition Majors: A faculty jury examination of representatives in composition must be passed at close of sophomore year. Seniors will present a recital of original music (or equivalent) for solo voice or instrument, and vocal and instrumental groups including 9 cr. in English for last composition for large ensemble.

Suggested Freshman Program: Music 201, 100, 106-110; Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature; English 100; Academic Electives, 15 credits.

C. CURRICULUM FOR BACHELOR OF ARTS DEGREE WITH A MAJOR IN MUSIC

Students with a pre-college background in performance may elect Curriculum C, a course designed to develop musicianship, to gain scholarly insight into the art of 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 a groundwork for graduate study in the fields of 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 of which 33 credits must be in the College of Arts and Sciences. A minimum of 33 Music credits applicable toward this degree: Performance, 12 cr.; Ensemble Music 6 cr.; (however, Music Department requires participation in Chamber Ensembles and Concert Orchestra). Course requirements for Curriculum C shall include: Music 201, 6 cr.; 401, 6 cr.; Music 106-110, 9 cr.; Theory I, 6 cr.; Aural Perception I, 6 cr.; Theory II, 6 cr.; Aural Perception II, 6 cr.; Music Literature, 4 cr.; Music Perception I, 3 cr.; Music Theory I, 6 cr.; Music Theory II, 6 cr.; Music Theory III, 6 cr.; Foreign Language, 30 cr., (Active skills): General 121-23, 8 cr.

Suggested Freshman Program: Music 201, 106-110; Theory I, Aural Perception I, Introduction to Music Literature, 3 cr; English 100; Academic Electives, 21 cr.

COURSES OF STUDY

Upon entrance into any performance study the student will be given a placement examination and assigned to the course to which his ability, previous training and experience entitle him.

MUSIC 100—Performance Minor 1-2 prereq c/l.

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
student certain proficiencies in order that he may use this application as a tool rather than as a medium for performance. A total of 12 credits is allowed in any one performance area.

MUSIC 201. 401 Performance Major V 1-4 R-24 prereq audition and completion of Theory 101-102 (.coreq of each course). Individual instruction in voice, piano, organ, string, wind, and percussion instruments. The students in Curriculum A must have a field which is secondary to their primary major, i.e., Music Education. A student entering in Music 201 should show evidence of the equivalent of two years' prior study. Students majoring in Performance (Curriculum B) must show talent for solo performance 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)

105-103-104 REFRENT BAND, CHOIR, ORCHESTRA 1 R-3. The life and literature of school music. Observation of conducting and teaching methods. Study on secondary instruments.

105 SUMMER SESSION CHORUS I. 106 UNIVERSITY CHOIR 1. 107 COLLEGIATE CHORALE I. 108 ORCHESTRA I. 109 UNIVERSITY BAND I.

Courses 105 through 110 are major musical organizations. Prereq 134; majors must satisfy requirements as stated for each curriculum; non-music majors may apply 6 credits toward graduation.

111-112-113 THEORY I 2. Materials and structure of music. Application of principles in two-, three-, and four-part writing and at the keyboard. 111 is prereq to 112; 112 and 113 are prereq to 114.

114-115-116 PIANO IN CLASS 1. All major and minor scales 2 octaves. 114 All major and minor triads in all positions. Harmonization of simple tunes with I IV V7 chords. Materials such as Oxford and Burrows Adult Beginner's books. Transposition, memorization, and sight-reading. The teaching of vocal techniques illustrated.

122-123-124 MUSIC EDUCATION IN THE ELEMENTARY SCHOOLS 1, 2, 3 (133) Keyboard Fundamentals and basic rudiments of music. (123-124) integration of materials into the elementary classroom. Emphasis placed on all aspects of teaching music creatively in the elementary school. (Not open to music majors. 125 may be waived on basis of proficiency examination. It is advisable to take Educ 200 before enrolling for this sequence.)

125-126-127 STRING INSTRUMENTS IN CLASS 1. Group instruction for beginning students on violin, viola, cello, and bass, with emphasis on teaching procedures.


134 INTRODUCTION TO CONCERT MUSIC 4 (3-2). Music in our present-day culture; illustrated lectures for the layman on forms, styles, and composers. Concert music is introduced, leading to the understanding of the concert and concert attendance. For non-majors only.

135 INTRODUCTION TO MUSIC LITERATURE 4. The elements 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 Renaissance through the Twentieth Century. Review of all periods of music history. Study of recordings. Concert attendance required. Open to non-majors with c/1. (Credit not allowed for both 135 and 135.)

137-138-139 AURAL PERCEPTION I 2, 3, coreq 111, 138-139, prereq or coreq 112-113. A laboratory course in singing and dictation to supplement Theory I.

140 ENSEMBLE GROUPS 1. Any small group of two or more players or singers may have a course outlined by the instructor. The development of sight reading and accompanying. Students may register for more than one ensemble group in any one semester. (128) Prereq 128, 129.

159 (159-160-161) COMPOSITION 2 R-4 prereq c/1. An introduction to the basic art of music composition. (May be substituted for upper division electives for students not majoring in theory or composition.)

211-212-213 THEORY II 2 prereq 113 and 139, coreq 237-238-239. Continuation of Theory I.

215-216-217 INTERMEDIATE PIANO IN CLASS 1 prereq Music 118 or placement test. All major and minor scales 2 octaves HT. Further development of harmonization, transposition, memorization, and sight-reading.

234-235-236 HISTORY OF MUSIC 2 prereq 135. Entry any quarter. The history of music in Western Civilization from its origin to modern times and its relationship to general cultural development.
511 (431) ADVANCED CONDUCTING 3 R-12 prereq 231 and c/l.
A continuation of 381, 302-303-304. Class and/or individual study of
the art 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 publi-
cations.
513 LITERATURE FOR HIGH SCHOOL CHORAL SOLO AND
SMALL ENSEMBLE GROUPS 2 a/y. Comparative study and per-
formance of literature with attention to pedagogical use as related to
style.
514 CURRENT LITERATURE FOR HIGH SCHOOL SOLO AND
SMALL ENSEMBLE GROUPS 2 a/y. Comparative study and per-
formance 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 ungraded schools. Prescribed texts for 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, compilation of materials, concepts
necessary for interpretation of data.
521 SYMPHONIC LITERATURE 3. A survey of orchestral mu-
cic: the Mannheim composers, the Viennese classics, the Romantics,
and contemporary European and American developments.
522 OPERATIC LITERATURE 3. Opera from its beginnings,
the Florentine Camera, 18th and 19th century French and Italian
opera, Gluck’s reform, Mozart’s dramatic works. The Romantic
opera in Italy and Germany, contemporary opera trends.
523 KEYBOARD LITERATURE 3. Keyboard literature from
the developments of the Baroque era to the contemporary period,
including the suite, sonata, character pieces, etc.
524 CHAMBER MUSIC LITERATURE 3. Survey of chamber
music, quartet, trio, quintet, etc., in various instrumental combina-
tions. The literature is presented through the analysis of formal
structure and aesthetic values are discussed.
525 SONG LITERATURE 3. The art song from the classic
period to the contemporary era including the German lied, French
chanson, and related literature.
526 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.
527 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 modern music, the serial technique,
and other new techniques of composition.
528 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.
530 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.
531 MIDDLE AND RENAISSANCE MUSIC 3. Survey of
music from monophony to the 16th century.
532-353 ADVANCED ORCHESTRATION 2 prereq 329.
Styles in orchestral techniques from 1780 to present.
534-556 ANALYTICAL TECHNIQUES 2. A survey of the
theoretical approach of leading composers from the polyphonic
period to the present.
57 TECHNIQUES OF COMPOSITION 2. An introduction to
composition for graduate students. Development of techniques and
skills necessary to the composer.
58 PEDAGOGY OF THEORY 3. The teaching of theory, in-
cluding techniques, procedures and sequences of materials and a
comparison of instructional techniques, and organization of the teaching of theory in secondary
school and college.
59 COMPOSITION V R-12.
60 SEMINAR V 1-5 R-15. Investigation of research in fields of
individual interest.
61 GRADUATE PROJECT IN MUSIC V R-4.
62 THESIS V R-15.

PHARMACY
is the science which is concerned with the study of the physical,
chemical, and biological characteristics of medicinal
substances. It embraces a knowledge of medicines, the art
of compounding and dispensing them, their
use, the methods of manufacturing and marketing, their
use, and the care of patients. The professional curriculum
in pharmacology, pharmacy, and pharmacy administration. A program of selected
electives allows the student to place emphasis upon an area of
specialization best suited to his future plans in pharmacy.

In addition to the formal education program, the candidate
for licensure as a registered pharmacist must complete
"practical experience" or internship under the direction of a
registered pharmacist and must pass an examination given
by the State Board of Pharmacy. Many graduates practice
pharmacy in neighborhood, or "downtown" stores. Others
work in hospital pharmacies, a particularly attractive field
for women. Additional opportunities exist as representatives
for pharmaceutical manufacturers, in government service,
in manufacturing pharmacy, and in pharmaceutical
journalism. Those with advanced degrees are in demand in research
positions and in pharmaceutical education.

The School of Pharmacy was established in 1907 at Montana State
College and was transferred to the University campus in 1913.

The School of Pharmacy is a member of the American Associa-
tion of Colleges of Pharmacy, and is accredited by the American Council on
Pharmaceutical Education.

A three-year professional program based on two years of general
college work and leading to the degree of Bachelor of Science in
Pharmacy is offered. The first two years are devoted to the pre-
scribed pre-professional subjects listed below and may be taken in
any accredited college or university. The professional curriculum
of the School of Pharmacy covers three years and must be taken in
residence at the University of Montana, although students transfer-
ing from other accredited schools of pharmacy may be admitted to an
advanced standing determined on the basis of credits presented,
providing that they are in good academic standing. Transfer credit
for required professional courses taken at other institutions will not
be accepted from students who previously received the grade of F
on those courses at the University of Montana.

Upper class students may choose approved elective courses de-
sign to prepare them specifically for either community pharmacy,
sales and management, research and teaching, or for hospital
and institutional pharmacy. Such elective courses will be determined by the
area of specialization chosen by the student, and must be ap-
proved by the faculty advisor.

HIGH SCHOOL PREPARATION. In addition to the general re-
quirements for admission to the University, it is recommended that
the high school preparation include algebra, trigonometry, biology,
and chemistry or physics.
REQUIREMENTS FOR ADMISSION TO THE PROFESSIONAL CURRICULUM:

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 accredited colleges):

   Applicants presenting two years of satisfactory college work but with 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 full time after 1969 and defined as more than 20 credits of 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 and must be submitted for consideration by the faculty of the School prior to registration. Applicants then will be granted full or provisional admission, or may be denied admission.

   The autumn quarter 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 may not have a grade point deficiency score of more than 10. If he has a greater deficiency, he may be granted provisional admission but will be required to complete all such courses, as the faculty may direct, in which he has received grades of "D" or "F" until he has reduced his deficiency to 10 or less. He 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 complete a degree upon the satisfactory completion of the senior year.

   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 at least 45 credits per year.
   3. Complete not less than 225 credits of course work.

   REQUIREMENTS FOR LICENSURE IN MONTANA. An applicant for licensure as a Registered Pharmacist in Montana must pass an examination by the State Board of Pharmacy. To be qualified for this examination, the applicant shall be a citizen of the United States, of good moral character, and shall have a grade point average of at least 2.0.

   All candidates for the degree of Bachelor of Science in Pharmacy must fulfill all requirements for the School of Pharmacy and must be granted full or provisional admission. Non-majors c/i. prereq Chem 482 or c/i. Analysis of the pharmaceutical industry.

PHARMACY CURRICULUM

First year: English or Speech Communication 111; Business Administration 201; Chemistry 481, 482, or 485, 483; Pharmacy 306, 320, 324, 326, 331, 352; Zoology 340-341; electives.

Second year: Microbiology 200, 302; Pharmacy 404, 414-415-416, 425, 444, 461, 462, 463, and electives.

Third year: Microbiology 411; Pharmacy 503, 504, 505-506, 516, 517-518-519, 545, 578, 579, 586, and electives.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

110 USE AND ABUSE OF DRUGS 3. The nature of drugs; their history, development and normal use in treatment of disease. Drug dependence, addiction, social and economic factors governing the known functional activity of prototype drugs that influence the mind or body or both.

382 DRUG ANALYSIS 4 (2-4). Special and instrumental methods used in the analysis of pharmaceutical preparations.

377 COMPUTER APPLICATIONS TO PHARMACY 2 (2-0) prereq CS 201 or c/i. Exercises in programming with reference to inventory, finances and drug activity.

404 INTRODUCTION TO DISPENSING 2 (1-2) prereq 463.

414-415-416 MEDICINAL CHEMISTRY 414-415, 3 (3-0); 416, 5 (5-0), prereq Chem 213 and 216. Organic substances used medicinally.

418 MEDICINAL CHEMISTRY LABORATORY 2 (0-0 to 9) R-4 prereq 414. Synthesis, identification and purity tests of organic medicinals.

425 (325) PHARMACOGNOSY 4 (3-3) Majors V 1-3 (1 cr./o), Non-majors c/i. prereq Chem 462 or c/i: Continuation of 324.

440 DRUGS OF PSYCHOPHARMACOLOGY 3 (3-0) prereq Chem 213, 216 and 462, Zool 341. Drugs which influence behavior.

444 APPLIED PHARMACOLOGY 5 (5-0) prereq 330, 331, Chem 482. Therapeutic and toxicologic aspects of chemical agents used as drugs.

461-462-463 PHARMACY 5 (3-0) prereq 320 and Chem 213 and 216. Fundamental techniques of pharmacy and the various classes of pharmaceutical preparations.

466 MEDICINAL PLANTS AND PHARMACOGNOSTICAL TECHNIQUES V 1-5 (0-3/cr) R-10 prereq 425. Collection, extraction and identification of the constituents of plants of medicinal importance, using chromatography and instrumental techniques.

468 DRUG MICROSCOPY V 1-4 (0-3/cr) R-5 Bot 115 or c/i: Microscopic and micro-chemical examination of drugs, foods and spices. The detection of adulterants and impurities.

593-504 BIOLOGICAL MEDICINAL PRODUCTS 3 (3-0) prereq Microb 302. Biologics, antibiotics, vitamins, hormones, and other medicinal products of biological origin.

505-506 DISPENSING 4 (2-6) prereq 404.

516 PHARMACEUTICAL LAW 3 (3-0) prereq senior standing in pharmacy.

517-518-519 PHARMACEUTICAL PRACTICE 1 (0-2) prereq senior standing in pharmacy.

545 APPLIED PHARMACOLOGY 5 prereq 444. Continuation of 444.

575 TOXICOLOGY 2 (2-0) prereq 416. The role of the pharmacist in poisoning prevention and emergency treatment.

577-578 PHARMACY ADMINISTRATION AND FINANCIAL MANAGEMENT 3 (3-0) prereq senior standing in pharmacy.

FOR UNDERGRADUATES AND GRADUATES

442 (340) RADIOPHARMACOLOGY 2 (2-0) R-6 prereq Chem 478 or c/i. Drug metabolism and internal dosimetry.

445 PHARMACODYNAMICS LABORATORY 1 2 R-6, prereq 444. Laboratory designed to give the interested and qualified student an opportunity to study some basic principles and methodology useful in determining drug effect.

546 PHARMACODYNAMICS LABORATORY II 2 R-6, prereq 545. Laboratory directed toward the initiation of research of known as well as unknown drug effects. Designed not only for those who are interested in drugs as therapeutic agents but also for those who utilize drugs to facilitate study and research in their specific discipline.

555 ADVANCED PHARMACY V 3-5 (0-9 to 15) prereq 506 or c/i. Problems involved in formulation and preparation of pharmaceuticals.

570 COSMETICS 3 (1-6) prereq 463. Cosmetic formulation.

585 ADVANCED DRUG ANALYSIS 3 (1-4) prereq 352.

592-593 HOSPITAL PHARMACY 1-3 (0-2/cr) prereq 505. Instruction and participation in the routine of a hospital pharmacy.

594 INSTITUTIONAL PHARMACY 3 (3-0) prereq c/i. major in pharmacy.

595 Duties and responsibilities of a pharmacist practicing in a hospital or related institution.

596 SEMINAR 1 (1-0) R-6 prereq senior standing in pharmacy.

599 SPECIAL PROBLEMS IN PHARMACY V 1-5 (0-3/cr) R-15 prereq senior standing in pharmacy or c/i. Research studies by conference, library and laboratory research in pharmacy, pharmacutical chemistry, pharmacognosy, pharmacy administration or pharmacy merchandising.

FOR GRADUATES

580 ADVANCED PHARMACEUTICAL LAW 3 (3-0) prereq c/i. Federal laws affecting the pharmaceutical industry.

581 DRUG DEVELOPMENT AND MARKETING 3 (3-0) prereq c/i. Administrative activities and decisions involved in the development and distribution of new pharmaceutical products.

582 ADVANCED PHARMACY ADMINISTRATION 3 (3-0) prereq c/i. 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.
PHILOSOPHY—65

567 CHROMATOGRAPHY 3 (5-6) 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.

592 ADVANCED PHARMACOGNOSTICAL TECHNICS V 1-3 (0-3 Vor. R-18) prereq 466 or c/l. Techniques used in investigative pharmacognosy.

593 CHEMISTRY OF NATURAL PRODUCTS 3 (3-0) R-9 prereq 416 and 425.

598 PHARMACEUTICAL CHEMISTRY 3 (3-0) R-9 prereq 416. Organic medicinals with emphasis on proof of structure, synthesis, structure-activity relationships and chemistry.

611 ADVANCED MEDICINAL CHEMISTRY LABORATORY 2 (6-0-6) R-6. Preparation, isolation and purification of organic medicinals by advanced techniques.

619 ADVANCED PHARMACOLOGY V 3-5 (9-0 to 15) prereq 545 or c/l. The more involved actions of drugs upon cells and organs.

630 PHARMACEUTICAL MANUFACTURING 3 (1-6) R-6. Preparation of various pharmaceutical dosage forms in bulk quantity.

632 PHYSICAL PHARMACY 3 (3-0) R-6. Pharmaceutical kinetics and biopharmaceutics.

534 PRODUCT DEVELOPMENT AND FORMULATIONS 3 (6-0) R-6 prereq 630. Practical aspects of manufacturing and theory of systems in developing new product formulation.

636 AEROSOLS 3 (2-3). Formulation and production of aerosols with emphasis upon pharmaceutical applications.

640 RADIOISOTOPES IN PHARMACY 3 (3-0) prereq chem 476. Types of radiation, methods of detection and use in pharmacy as therapeutic agents and as diagnostic and research tools.

685-686-687 ADVANCED MOLECULAR BIOLOGY LABORATORY V 1-3 prereq Chem 482 or c/l. (Crosslisted as Botany, Chemistry, Microbiology, Zoology.)

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 general requirements must be met in order to be eligible for the Bachelor of Arts degree with a major in Philosophy: a minimum of 50 credits including Philosophy 110, 210, 296, 299, 300, and three or more credits in courses numbered 400 or above. Normally students are expected to complete Philosophy 286, 299, 300 by the end of their sophomore year. All students, upon becoming Philosophy majors, must have a departmental advisor assigned by the chairman of the department. Foreign languages and any other departmental requirement (in addition to those indicated above) are to be determined in consultation with this advisor. It should be noted, however, that writing appears 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, the nature 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.

298 (201) HISTORY OF ANCIENT PHILOSOPHY 5.

299 (202) HISTORY OF MEDIEVAL AND RENAISSANCE PHILOSOPHY prereq 298.

FOR UNDERGRADUATES AND GRADUATES

300 (203) HISTORY OF MODERN PHILOSOPHY prereq 299.

301-302-303 GREAT PHILOSOPHERS 1. (Given in the Summer for 3 cr. as 304). Enter any quarter. (301) Greek, Roman and early Christian thinkers. (302) Late Medieval, Renaissance and some modern thinkers. (303) Recent and contemporary thinkers. Not open to Philosophy majors for graduate credit.

310 (335) PHILOSOPHY OF SCIENCE 5 e/y prereq c/l. The metaphysical foundations of modern classical (Newtonian) science: contemporary views on the nature and limitations of scientific "explanations," theories, models and concepts.

311 (336) PHILOSOPHY OF LANGUAGE 5 e/y prereq c/l. Structural and functional ideal languages; the relations of language to thought and to reality.

320 CONTEMPORARY ETHICAL THEORIES 5 prereq 120 and/or 300. Recent theories on the nature of moral concepts.

323 (369) POLITICAL PHILOSOPHY 3 e/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.

351 PHILOSOPHICAL FOUNDATIONS OF THE SOCIAL SCIENCES 5 e/y prereq 5 credits in Philosophy. The philosophical problems with respect to representative theories in Psychology, History, Sociology.

350 ETHICS 3 prereq 3 credits in Philosophy. The nature of aesthetic experience, and the standards of art criticism, and of the kinds of knowledge communicated by art. Readings from philosophy, literature, and art history.

341 PHILOSOPHY IN LITERATURE 3 prereq 10 credits in Philosophy or Literature or c/l. Philosophical thought in selected masterpieces of literature.

345-346-347-348 PHILOSOPHY OF THE ARTS 3 prereq 3 credits in Philosophy or 3 credits in music, visual arts, literature or c/l. Enter any quarter. (345) Music. (346) Visual arts. (347) Literature. (348) Film. Examination of philosophical problems related to the various 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 to the relation of perception to the physical world, and to the concept of proof.

351 METAPHYSICS 3 prereq 10 credits in Philosophy. What is the basis of metaphysics? What metaphysical 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. The autonomy 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.

355 DESCARTES, SPINOZA, LEIBNIZ 5 e/y prereq 300 or 10 credits in Philosophy and c/l. The development of Continental Rationalism.

366 LOCKE, BEKERELEY, HUME 5 o/y prereq 300 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.

570 MAJOR PHILOSOPHERS OF THE NINETEENTH CENTURY 5 R-10. as 500 or 10 credits in Philosophy and c/l. Selection to be announced in the class schedule.

273 EXISTENTIALISM 5 prereq 10 credits in philosophy and c/l. Selected readings from the philosophical works of one or more existentialist thinkers.
PHYSICS

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, no more than 6 of which can be in physical education (HPER 100) 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 at least 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 others 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.

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 201, 202, 203, 204, 221, 222. This combination of courses is not offered in any other departments. The requirements for the Bachelor of Arts degree with a major in physics are satisfied by the following courses in any sequence or combination: (1) Five of the following: 201, 202, 203, 204, 221. Required courses are offered in each of the groups of magnetic, light, and atomic physics. For non-physical science majors, credit not allowed for both 111-112-113 and 221-222-223. (2) Six courses in the subjects of mechanics, heat, electricity, and magnetism. Required courses are offered in the groups of magnetic, light, and atomic physics. For non-physical science majors, credit not allowed for both 111-112-113 and 221-222-223.

FOR UNDERGRADUATES

FOR EXPLANATION SEE COURSE DESCRIPTIONS (INDEX)

111-112-113 GENERAL PHYSICS 5 (5-0) prereq for 111. Math 107, 111 is prereq for 112 and 113, but 112 is not prereq to 111. (111) Mechanics and wave motion. (112) Heat, electricity and magnetism. (113) Optics, heat, electricity, and magnetism.

221-222-223 GENERAL PHYSICS 5 (5-0) prereq for 221; Math 118 or 122. 221 is prereq for 222 and 223, but 223 is not prereq to 222. (221) Mechanics and wave motion. (222) Heat, electricity, and magnetism. (223) Optics, heat, electricity, and magnetism.

251-252-253 LABORATORY ARTS I (0-0) prereq 223. Open to upper division physics majors who have completed 253. Enter any quarter. Elements of glass blowing, machine shop practice, and electronic construction techniques.

FOR UNDERGRADUATES AND GRADUATES

301 (371) VECTOR ANALYSIS 3 (3-0) prereq 222 and Math 252.

314-315-316 ELECTRICITY A W 3 (3-0), S 4 (3-3) prereq 301.

322-323-324 LIGHT 2, A W (2-0), S 1 (3-3) prereq 223 and Math 253.

328 METHODS OF TEACHING PHYSICS 3 (2-4) prereq 221, 222, 223. Texts, demonstrations and laboratory experiments used in contemporary approaches to teaching of high school physics. (Credit not allowed toward degree in physics.)

331 MECHANICS AND HEAT 5 (5-0) prereq enrollment in the N.S.F. Summer Institute in Mathematics. Other students may enroll by special permission.

332 ELECTRICITY RADIATION AND ATOMIC PHYSICS 5 (5-0) prereq enrollment in the N.S.F. Summer Institute in Mathematics. Other students may enroll by special permission.

341 FUNDAMENTALS OF MODERN PHYSICS 5 (5-0) prereq one year of general physics. Not for physics majors.

371-372-373 (471-472) MECHANICS 3 (3-0) prereq 301 and Math 253.

431 SELECTED TOPICS V 1-5 R 10 prereq c/l and 15 credits in Physics.
A student may offer a combination major in Political Science and Economics with a minimum of 60 credits selected from the two disciplines of which at least 30 credits will be in Political Science and 20 credits in History. A minimum of 30 credits must be selected from courses numbered over 300.

The majors in Political Science are (1) American Government and Politics with national, state and local government, politics, and public law as subfields, (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 190, Economics 211-212-213 and a minimum of 45 credit hours in Political Science with 30 credits from courses numbered 200 and over.

Political Science courses required of all majors are: 201, 202, 231 and 485, one course in theory, and one course in comparative government. Majors must take at least one additional course in 3 of the 5 fields listed above.

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 20 credits must be selected from courses numbered over 300.
**PRE-MEDICAL SCIENCES**

The Pre-medical Sciences curriculum is designed to provide the basic training required of students who plan careers in Dentistry, Medicine, Veterinary Medicine, and medically related fields. It is a four year program leading to the Bachelor of Science degree with a major in the Pre-medical Sciences. The Pre-medical Science student should normally, however, major in an ancillary field and simultaneously satisfy the major department requirements and the Pre-medical Sciences curriculum requirements.

Requirements for admission to medical and dental schools have been standardized by the professional schools and their governing agencies in terms of the needs of the professions concerned and their licensing boards.

Students in Pre-veterinary Medicine and in Optometry are advised to plan their programs carefully at 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-dent student who must do well in the American Dental Aptitude Test. Pre-professional 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 English, 2-4 years of mathematics, some Latin or several years of a foreign language, 3 years of physical science, 2-4 years of social studies, and 2-4 years of laboratory 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 needs his bachelor's degree is a degree in Science, and it includes 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 that only 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. 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 in the catalogue, and (3) his chosen major field. The student should consult with the pre-medical sciences adviser and the major adviser before the sophomore year in residence.

The Western Interstate Commission for Higher Education was designed to provide financial aid for dental, medical, veterinary medicine, and other professional students attending Western professional schools.

**MINIMUM COURSE REQUIREMENTS FOR THE PRE-MEDICAL SCIENCES STUDENT.**

- English 6-9 credits: Humanities 12-15 credits; Social Sciences 12-15 credits; a reading knowledge of a modern foreign language or 25 credits in French, German, or Russian; Chemistry through Organic, Quantitative, and Survey of Physical; one year of college mathematics; one year of college physics; Zoology through Vertebrate Embryology; Psychology 8-10 credits; and 3-6 credits are recommended in HPER.

- It is possible for the Pre-medical Sciences students who has satisfied the course requirements specified above to earn a Bachelor's degree in an ancillary field. A degree in a related field such as Chemistry, Mathematics, Microbiology, Physics, Pharmacy, or Zoology may be earned by completing course work as selected. 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>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>English 100</td>
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<td>5 5 5</td>
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<tr>
<td>Chemistry 121, 122, 123</td>
<td>5 5 5</td>
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<tr>
<td>Electives</td>
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**FOR GRADUATES**

- **SEMINAR IN URBAN STUDIES 3.** Selected topics in urban affairs. (Also listed as Soc 287-288-289.)
- **SEMINAR IN METHODS OF INQUIRY AND RESEARCH DESIGN 3.**
- **INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-0.** Research in fields appropriate to the needs and objectives of the individual students. (366) 3 prereq 267 or c/l. Structure.
- **SEMINAR IN COMPARATIVE GOVERNMENT AND POLITICS 3.**
- **SEMINAR IN INTERNATIONAL RELATIONS 3.**
- **SEMINAR IN POLITICAL BEHAVIOR 3.**
- **SEMINAR IN POLITICAL THEORY 3.**
- **SEMINAR IN PUBLIC ADMINISTRATION 3.**
- **SEMINAR IN PUBLIC LAW 3.**
- **SEMINAR IN STATE AND LOCAL GOVERNMENT 3.**
- **THESIS V R-15.**

**STATE GOVERNMENT 3 prereq 262. Structure, functions, and operations of state governments; position of state governments in the federal system with Montana as an example.

**LOCAL GOVERNMENT AND POLITICS 3 prereq 261.** Structure and processes of local government. (364) Problems and policies of urban areas; field investigation.

**LEGISLATIVE PROCESS 3 prereq 261.** Structure, politics, personnel and processes of national and state legislative bodies.

**LEGISLATIVE PROCESS (Offered Winter and Spring quarters of each academic year).** (366) 3 prereq 261. Structure, processes, and politics of Montana Legislative Assembly; visits to the state legislature. (386) 2. Research topics on selected aspects of the legislative process.

**INTERNATION-SIMULATION 5, prereq 231.** A simulated exercise of a real international system in which students play the roles of heads of foreign policy advisors, etc. Emphasis on foreign policy, decision making and crisis management.

**SPECIAL STUDIES IN POLITICAL SCIENCE V 1-4 R-4 prereq one course numbered above 300 in Political Science. Selected aspects of politics, government or international relations. Offered by different instructors under various titles.

**COMPARATIVE MARXIST THEORY 3 prereq 12 credits in Political Science or c/l. Analysis of relevant writings of major Marxist thinkers in selected countries.** (333) 3 prereq 322. The law of nations in relation to peace, war, and collective security.

**THE AMERICAN CONSTITUTIONAL SYSTEM 3 prereq 201.** (471) The courts, judicial review and the federal system. (472) Judicial protection of civil rights.

**PUBLIC LAW OF MONTANA 3 prereq 471 or 381.** The Montana Constitution as an instrument of government, and selected problems in its judicial interpretation.

**SENIOR PRO-SEMINAR IN POLITICAL SCIENCE 3 open only to majors in Political Science. Selected topics.**

**INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-0 prereq 12 credits in Political Science courses numbered above 300 and c/l. Research in fields appropriate to the needs and objectives of the individual students. (366) 3 prereq 267 or c/l. Structure.

**METHODS AND MATERIALS 3 open to departmental majors only.** A survey of the discipline of political science, emphasizing traditional and contemporary methods of research as illustrated by the works of major recent and contemporary political scientists.

**THE R-9. Research in fields appropriate to the needs and objectives of the individual student.** (365) 3, 365 3, 365 3. Problems and policies of administration illustrated by case materials and field investigation.

**GOVERNMENT AND THE ECONOMIC ORDER 3 prereq 202.** Government as regulator, promoter, and participant in the economic order.

**THE AMERICAN PRESIDENCY 3 prereq 201.** The constitutional foundation and evolution of the executive branch, the structure of the office, executive powers. Case studies of the problems of decision-making in the White House.

**THE ENVIRONMENT AND POLITICS 3.** An examination of the political process as it relates to environmental questions. Participation in decision making will be devoted to the politics of air, water, and land pollution, as well as to the general issues of the quality of life.

**STATE GOVERNMENT 3 prereq 262. Structure, functions, and operations of state governments; position of state governments in the federal system with Montana as an example.

**LOCAL GOVERNMENT AND POLITICS 3 prereq 261.** Structure and processes of local government. (364) Problems and policies of urban areas; field investigation.

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**INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-0 prereq 12 credits in Political Science courses numbered above 300 and c/l. Research in fields appropriate to the needs and objectives of the individual students. (366) 3 prereq 267 or c/l. Structure.

**METHODS AND MATERIALS 3 open to departmental majors only.** A survey of the discipline of political science, emphasizing traditional and contemporary methods of research as illustrated by the works of major recent and contemporary political scientists.

**FOR GRADUATES**

- **SEMINAR IN URBAN STUDIES 3.** Selected topics in urban affairs. (Also listed as Soc 287-288-289.)
- **SEMINAR IN METHODS OF INQUIRY AND RESEARCH DESIGN 3.**
- **INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-0.** Research in fields appropriate to the needs and objectives of the individual students. (366) 3 prereq 267 or c/l. Structure.
- **SEMINAR IN COMPARATIVE GOVERNMENT AND POLITICS 3.**
- **SEMINAR IN INTERNATIONAL RELATIONS 3.**
- **SEMINAR IN POLITICAL BEHAVIOR 3.**
- **SEMINAR IN POLITICAL THEORY 3.**
- **SEMINAR IN PUBLIC ADMINISTRATION 3.**
- **SEMINAR IN PUBLIC LAW 3.**
- **SEMINAR IN STATE AND LOCAL GOVERNMENT 3.**
- **THESIS V R-15.**
PRE-NURSING

The School of Nursing at Montana State University, Bozeman, accepts transfer students from the University of Montana who have completed the Pre-Nursing program listed below. Students who desire admission to the School of Nursing, Montana State University, should transfer at the beginning of Autumn Quarter of the sophomore year. Applications for admission to Montana State University should be completed during the summer previous to entrance. Students with sophomore standing wishing admission to a school of nursing other than Montana State University should consult the catalog of the school of their choice for the selection of a freshman program.

**Art 200—The Ancient World or Art 135—Design—Survey of Western Art**

**Chem 101, 102—General Chemistry**

**Home Ec. 146—Elementary Nutrition**

**HPER 200—Human Anatomy**

**Micro 100—Elementary Microbiology**

**Micro 106—Elementary Microbiology Lab**

**Micro 102—Elementary Medical Microbiology**

**Soc 101—Introductory Sociology**

**Zool 202—Human Physiology**

*Math may take a 3 credit elective to substitute for 100 level Pre-Considerations Seminar

**Electives: Total of 9 credits:**

**Engl 100—Lower Division Composition or Pharm 110—Use and Abuse of Drugs**

**Home Ec 102—Personal & Family Living**

**Speech Communication 111—Introduction to Public Speaking**

**Sophomore Year**

<table>
<thead>
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<th>Course</th>
<th>A</th>
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<td>English 100</td>
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<tr>
<td>Zoology 111, 112 or 113, 304</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Chemistry 261, 262, 370</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Foreign Language 101, 102</td>
<td>5</td>
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<tr>
<td>Electives</td>
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</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>A</th>
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<th>S</th>
<th>Cr.</th>
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<tbody>
<tr>
<td>Chemistry 245, 481 and 482 recommended</td>
<td>(5)</td>
<td>(5)</td>
<td>(5)</td>
<td></td>
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<tr>
<td>Physics 111, 112, 113 or 215, 225</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
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<tr>
<td>Foreign Language</td>
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<tr>
<td>Electives</td>
<td>3</td>
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</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>A</th>
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<th>Cr.</th>
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<tbody>
<tr>
<td>Zoology 404, 485</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>English 480</td>
<td>5</td>
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</tr>
<tr>
<td>Electives and science sequence</td>
<td>10</td>
<td>7</td>
<td>15</td>
<td>192</td>
</tr>
</tbody>
</table>

**English Composition**

- At least one English composition course, Mathematics 125 and Zoology 111-112-113 or 111 and 202 are required. The major is strongly advised to take Mathematics 344-345-346, all other mathematics courses that time and talent allow, work in anthropology, literature, philosophy, sociology and additional work in zoology.

- The major preparing for graduate work in psychology is advised to take Psychology 420 and 491. Those students with sufficient preparation and who show promise are encouraged to take some graduate courses during their senior year.

- The Department recommends that majors in Psychology attain proficiency in at least one foreign language.

**GRADUATE WORK.** See Graduate School Bulletin.

**FOR UNDERGRADUATES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Prereq</th>
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</thead>
<tbody>
<tr>
<td>110 INTRODUCTION TO PSYCHOLOGY 5 (4-0)</td>
<td>111.</td>
</tr>
<tr>
<td>111 INTRODUCTION TO EXPERIMENTAL PSYCHOLOGY 5 (4-2)</td>
<td>110. Advanced general psychology. Experimental and quantitative methods employed in laboratory approaches to the scientific study of behavior.</td>
</tr>
<tr>
<td>190 PSYCHOLOGICAL INVESTIGATION V 1-3 R-5</td>
<td>prereq 110 and c/i. Supervised investigation of psychological problems.</td>
</tr>
<tr>
<td>210 (311) LEARNING 5 (4-2)</td>
<td>prereq 111. Principles of behavior change.</td>
</tr>
<tr>
<td>215 (312) MOTIVATION 5 (4-2)</td>
<td>prereq 111. Conditions which influence basic drives, incentives, and the development of complex motives.</td>
</tr>
<tr>
<td>220 PSYCHOLOGICAL STATISTICS 5 (4-2)</td>
<td>prereq 111 and Math 302. Application of various statistical techniques to psychophysical data.</td>
</tr>
<tr>
<td>230 (312) PHYSIOLOGICAL PSYCHOLOGY 5 (4-2)</td>
<td>prereq 111, course(s) in zoology recommended. Basic neural regulatory mechanisms underlying behavior.</td>
</tr>
<tr>
<td>240 SOCIAL PSYCHOLOGY 5 (4-2)</td>
<td>prereq 111. Individual behavior as a function of interpersonal interaction. Emphasis on research literature.</td>
</tr>
<tr>
<td>310 (312) SENSORY PROCESSES AND PERCEPTION 5 (4-2)</td>
<td>prereq 111.</td>
</tr>
<tr>
<td>315 (206) COMPARATIVE PSYCHOLOGY 5 (4-2)</td>
<td>prereq 111. Meaning and purpose of our and other animals' lives in terms of the biological principles which rule us.</td>
</tr>
<tr>
<td>320 (312) PERSONNEL PSYCHOLOGY 5 (3-0)</td>
<td>prereq 110. Selection, classification, and training; worker efficiency and adjustment problems.</td>
</tr>
<tr>
<td>321 SYSTEMATIC PSYCHOLOGY 5 (5-0)</td>
<td>prereq 110. Description and classification of abnormal orientations, with emphasis on their psychological dynamics.</td>
</tr>
<tr>
<td>325 PROBLEMS IN PSYCHOLOGY V 3-0</td>
<td>prereq 15 credits in Psychology and c/i.</td>
</tr>
<tr>
<td>411 INDUSTRIAL PSYCHOLOGY 5 (5-0)</td>
<td>prereq 110. Applications of psychology in industry.</td>
</tr>
<tr>
<td>412 PERSONALITY DYNAMICS 4 (4-0)</td>
<td>prereq graduate standing or senior with c/i. Types of motivation, frustration, conflict, and defense mechanisms. Major emphasis on psychoanalytic dynamics.</td>
</tr>
<tr>
<td>413 INDIVIDUAL DIFFERENCES 3 (3-0)</td>
<td>prereq 110. Nature and extent of individual and group differences.</td>
</tr>
<tr>
<td>480 MATHEMATICAL MODELS IN PSYCHOLOGY 4 (4-0)</td>
<td>prereq 220 and 311 or c/i. Derivation and evaluation of some of the more complex models of learning, choice behavior, and signal detection.</td>
</tr>
<tr>
<td>490 TOPICAL SEMINAR V R-9</td>
<td>prereq 15 credits in Psychology and c/i. Topics of current interest with critical examination of the literature.</td>
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</table>

**FOR GRADUATES**

501-502-503 PROSEMINAR 8 (3-0) | 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.
70—RADIO AND TELEVISION

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 pertinent 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 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.


521-522-523 ADVANCED PSYCHOLOGICAL STATISTICS 4 (4-0). (521) Brief review of algebra and summation, discrete and continuous probability distribution, expectation, and distribution of parameter estimates. (522) Hypothesis testing, Type I and II errors, power, single factor analysis of variance, regression, and analysis of variance as a special case of regression. (523) Individual comparisons and contrasts, higher order factorial designs, and special topics.

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 consultative interviewing practices. 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.

550-551-552 PSYCHOLOGICAL EVALUATION 4 (2-2) prereq c/l. Administration, scoring, and interpretation of standard tests, with supervision of 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.

596 PRINCIPLES OF PSYCHOTHERAPY 4 (4-0) prereq 561. Major theoretical and technical approaches to psychotherapy.

599 INDEPENDENT RESEARCH V 1-6 R-18.

600 THESIS V R-10.

601 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.

695 CLINICAL INTERNSHIP 0 prereq acceptable proficiency in clinical techniques. Clinical internship offered by the psychology staff of a hospital, clinic, or other approved agency.

696 ADVANCED PSYCHOTHERAPY 2 (3-0) R-6 prereq 566 or c/l. A continuous and intensive study of the psychotherapeutic relationship and the various therapeutic techniques including supportive, client-centered, analytic, and hypotherapeutic.

699 ADVANCED CLINICAL PRACTICUM 2 (0-4) R-6 prereq 562. Directed experience in clinical supervision.

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.

FOR UNDERGRADUATES

140 INTRODUCTION TO RADIO AND TELEVISION 3. Open to non-majors.

341-342-343 (240, 242, 345) RADIO PRODUCTION 2 prereq 140 for 341; prereq 341 and Journ 270 for 342; prereq 341 for 343. Work on faculty-directed University radio station. (341) Operation of broadcasting equipment, FCC regulations and writing for radio. (342) Planning and production of news and special affairs. (343) Advanced training in areas of broadcasting.

346 RADIO-TELEVISION PUBLIC AFFAIRS (see Journalism).

348 RADIO-TELEVISION ADVERTISING AND MANAGEMENT 3 prereq 140.

FOR UNDERGRADUATES AND GRADUATES

399 ADVANCED RADIO-TELEVISION PROBLEMS V prereq consent of the chairman.

440 CINEMATOGRAPHY (see Journalism).

441-442-443 TELEVISION PRODUCTION AND DIRECTION 3 prereq 12 hours in radio-television courses. Preparing, producing and directing television programs. Preparation of news and special affairs programming for television.

494 RADIO-TELEVISION SEMINAR 3 prereq or coreq 441. Radio-television and their responsibilities with emphasis on responsibilities of the broadcasting industry.
RELIGIOUS STUDIES

The proper sphere for the academic study of religions is understood to be coextensive with the broad field of human experiences in which the question of the humanity of man lies closest. It is intended that the study of religions in the University will therefore be taken up in closest conjunction with the humanities, arts, letters, and the natural, social and life sciences. Radial relations are planned with the various 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 transmission of the enormous body of literature of 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 own cultural and social existence. Thus courses are designed to illuminate the religious traditions that inform 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 art"; the student of religion will be afforded critical distance on his own religious tradition and at the same time liberated 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. Prereq. A critical study of the religious phenomenon of religion in relation to 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.

120 RELIGION IN AMERICA 3. Religious life and thought in the United States as viewed in the context of and as a dimension of the development of American culture.

201-202 HISTORY OF THE ANCIENT NEAR EAST 3. Enter either quarter. Prereq. 101-102. The political, cultural and religious history of the Near East from the neolithic period to the time of Alexander the Great (330 B.C.) (201) and the Hellenistic civilization with special emphasis on the problem of cultural syncretism. (202).


212 THE LEGACY OF PAUL 3. The life and letters of Paul; the structure and development of the Christian faith; the legacy of Paul in Reformation and post-Reformation Christianity.

226 THE RISE OF HISTORICAL CONSCIOUSNESS IN THE ANCIENT NEAR EAST 3 prereq History 201 or R.S. 201. Mythology, mythography, ethnography and rude historiography and their influence on the Western understanding of history.

248 RELIGIOUS ETHICS 3. A study of the ethics of a representative variety of major religions; movements and figures (e.g., Mysticism east and west; modern Islam, Soka Gakkai, Hasidic Judaism, American social gospel movement; Puritanism, Gandhi, Luther, Tolstoy, John XXIII).

275 CONTEMPORARY THEOLOGY 3 prereq 3 credits in Philosophy or R.S. The thought of major Christian figures, Protestant and Roman Catholic, in the 20th Century.

311 THE BIBLE IN THE AMERICAN TRADITION 3 prereq History 261 and 262 or c/l. Primary documents in the history of American biblical interpretation; the relation of biblical interpretation to theological issues and broader cultural phenomena.

312 CONTEMPORARY BIBLICAL INTERPRETATION 3 c/l. Major biblical interpreters in the twentieth century.


347 HUMAN SPIRIT AND TECHNOLOGY 3 prereq 10 credits in physical sciences or c/i. The "reverence" and "production" in human society. Some classical and medieval sources will be used, but the emphasis will fall on modern industrial society.

348 GOD-LANGUAGE IN NINETEENTH CENTURY THOUGHT 3 prereq 10 credits in Philosophy or c/l. 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.

354 PHILOSOPHY OF RELIGION 5, prereq 5 credits in Philosophy and 5 credits in Religious Studies, or c/l. Philosophical dimension of selected phenomena of experience and investigation of types of religious sensibility. (Same as Philosophy 354.)

356 RELIGION IN CONTEMPORARY SOCIETY 3-5, c/l. A critical study of religious issues as expressed in selected works from contemporary letters, arts (visual, plastic, musical), and social commentary.

370 RELIGION AND POLITICAL IMAGINATION prereq 5 cr. in Literature or Religious Studies. An exploration of the study of religious issues, domestic and international politics, church-state issues, and the interaction between religious and political imagination.

379 ATHEISM IN THE MODERN WORLD 10 credits in Literature or Religious Studies. 3. Major motifs of atheistic religious theories as expressed by leading atheistic thinkers and in related cultural and social movements.

496 PROBLEMS IN RELIGIOUS STUDIES 5 R 5-15, prereq 30 credits in Liberal Arts and c/l. Study or research in topics selected according to the needs and objectives of the individual student.

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. These programs are designed to provide education that will develop skills and attitudes vital to the career professional Air Officer. The commission is tendered upon satisfactory completion of either program and being awarded a degree from the University.

FOUR-YEAR PROGRAM

The four-year program requires completion of the General Military Course and the Professional Officer Course during four years of study, as well as the University Four-Year Program. Air Force Field Training is also required. A monthly retainer fee (currently $50) is paid to all students enrolled in the Professional Officer Course. Scholarships (full tuition, fees, book allowance and the monthly retainer fee) are available to a number of students enrolled in either the 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: the strategic offensive and defensive forces; the elements, function and employment of nuclear weapons; civil defense; aerospace defense; U.S. general purpose and aerospace support forces; the role of resources and the political problems of war; 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; relations of decision-making; organization and function of the Department of Defense, 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) is a prerequisite for admission into the Professional Officer Course. In addition the student must enlist in the Air Force Reserve (this enlistment may be cancelled if student withdraws from the University or for other specific reasons), pass a physical examination and the Air Force Officer Qualifying Test.
201-302-303 APPLIED LEADERSHIP AND MANAGEMENT 2
401-402-403 APPLIED LEADERSHIP AND MANAGEMENT 3
201-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 1
301-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 2
Principles and techniques of military leadership and management. Emphasis on the use of military and other governmental agency maps. Introduction to small unit tactics with emphasis on leader­ship and command. Course consists of a study of American Military History from pre-colonial period to the Civil War with special emphasis on the leadership principles, tactics, and strategies of war and development of the military in an emerging United States. 201-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 3
Principles and techniques of military leadership and management. Emphasis on selection campaigns and the factors which lead to tactics utilized by our present day Army. Two hours of classroom theory and one hour of leadership laboratory each week. Leadership laboratory consists of practical application in instruction and directing small units and other exercises designed to develop the junior officer.

404 FLIGHT TRAINING.
(36% hours) Basic flying maneuvers, cross country flying, and advanced flying maneuvers for a total of 360 flying hours. 300 hours dual instruction, 15 hours in practical solo application and 15 hours for FAA examination. Instruction is given by arrangement.

ARMY ROTC
The Department of Military Science offers a two and a four­year program leading to a commission in the United States Army. The commissioning program fulfills the University requirements for a baccalaureate degree and Army requirements for commission as an officer. 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 upon completion of the third year of ROTC. 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 advanced summer camp. However, as a prerequisite to beginning this course, the student must apply to and attend a special six-week basic camp. A monthly subsistence allowance (currently $50) is paid to all cadets in the Ad­vanced Course. (101) Introduction to leadership and management training. No credit. This elective is offered at all three Army ROTC camps and for the Advanced Course at the four year program.

201-103-105 FUNDAMENTALS OF MILITARY LEADERSHIP
201-103-105 FUNDAMENTALS OF MILITARY LEADERSHIP 2
201-103-105 FUNDAMENTALS OF MILITARY LEADERSHIP 3
201-103-105 FUNDAMENTALS OF MILITARY LEADERSHIP 4
Four year program requires successful completion of two summer camps and the Advanced Course (300-400 series). Admission into the Advanced Course is based on the student's overall academic performance, military aptitude and leadership qualities. Students interested in acquiring a commission in the U.S. Army through the two year program should consult with the Professor of Military Science no later than Winter Quarter of their sophomore year. Seniors contemplating entry into Graduate or Law School should also consult with the Professor of Military Science during the Winter Quarter preceding graduation.

250 BASIC CAMP. No credit. Prerequisite for entry into Ad­vanced Course. The camp brings the student to a level of military leadership and education which will qualify him for enrollment in the Advanced Course. Applicants must pass a physical examination and the aptitude test prescribed by the Department of the Army; and they must be recommended by both the President of the University and the Professor of Military Science before they will be selected for admission to the course. In addition, the student is required to enlist in the United States Army Reserve. This enlistment may be cancelled if the student withdraws from the University or for other specified reasons.

201-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 3.
Principles and techniques of military leadership and management. Emphasis on problems of leadership and military teaching methods. (302) Problem solving and staff procedures. Basic flying maneuvers, cross country flying and advanced flying maneuvers for a total of 360 flying hours. 300 hours dual instruction, 15 hours in practical solo application and 1 hour of military leadership laboratory each week. Leadership laboratory consists of practical application in instruction and directing small units and other exercises designed to develop the junior officer. Students interested in acquiring a commission in the U.S. Army through the two year program should consult with the Professor of Military Science no later than Winter Quarter of their sophomore year.

ADVANCED COURSE: OFFICER TRAINING
In the four year program, completion of the Basic Course is a prerequisite for admission to the Advanced Course. Applicants must pass a physical examination and the aptitude test prescribed by the Department of the Army; and they must be recommended by both the President of the University and the Professor of Military Science before they will be selected for admission to the course. In addition, the student is required to enlist in the United States Army Reserve. This enlistment may be cancelled if the student withdraws from the University or for other specified reasons.

201-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 3.
Principles and techniques of military leadership and management. Emphasis on problems of leadership and military teaching methods. (302) Problem solving and staff procedures. Basic flying maneuvers, cross country flying and advanced flying maneuvers for a total of 360 flying hours. 300 hours dual instruction, 15 hours in practical solo application and 1 hour of military leadership laboratory each week. Leadership laboratory consists of practical application in instruction and directing small units and other exercises designed to develop the junior officer. Students interested in acquiring a commission in the U.S. Army through the two year program should consult with the Professor of Military Science no later than Winter Quarter of their sophomore year.

FLIGHT TRAINING.
(36% hours) Basic flying maneuvers, cross country flying and survival training. Flying time consists of 360 flying hours. 300 hours dual instruction, 15 hours in practical solo application and 15 hours for FAA examination. Instruction is given by arrangement.

TWO YEAR PROGRAM
The two year program requires successful completion of two summer camps and the Advanced Course (300-400 series). Admission into the Advanced Course is based on the student's overall academic performance, military aptitude and leadership qualities. Students interested in acquiring a commission in the U.S. Army through the two year program should consult with the Professor of Military Science no later than Winter Quarter of their sophomore year. Seniors contemplating entry into Graduate or Law School should also consult with the Professor of Military Science during the Winter Quarter preceding graduation.

250 BASIC CAMP. No credit. Prerequisite for entry into Ad­vanced Course. The camp brings the student to a level of military leadership and education which will qualify him for enrollment in the Advanced Course. Applicants must pass a physical examination and the aptitude test prescribed by the Department of the Army; and they must be recommended by both the President of the University and the Professor of Military Science before they will be selected for admission to the course. In addition, the student is required to enlist in the United States Army Reserve. This enlistment may be cancelled if the student withdraws from the University or for other specified reasons.

201-302-303 ADVANCED LEADERSHIP AND MANAGEMENT 3.
Principles and techniques of military leadership and management. Emphasis on problems of leadership and military teaching methods. (302) Problem solving and staff procedures. Basic flying maneuvers, cross country flying and advanced flying maneuvers for a total of 360 flying hours. 300 hours dual instruction, 15 hours in practical solo application and 1 hour of military leadership laboratory each week. Leadership laboratory consists of practical application in instruction and directing small units and other exercises designed to develop the junior officer. Students interested in acquiring a commission in the U.S. Army through the two year program should consult with the Professor of Military Science no later than Winter Quarter of their sophomore year.
SOCIAL WELFARE
is a broad field of study. As a liberal arts discipline it is concerned with the study of the network of human helping services, including their development, organization, and operation in society.

The profession of social work is only one of a large range of professions that fall within the social welfare network. Social work undertakes to facilitate human development through personally satisfying and socially sanctioned life experiences. Social workers are expected to develop a range of skills and knowledge for use in intervening in the lives of individuals, small groups, and complex organizations. The degree of Bachelor of Arts is offered in social welfare. In addition, students planning a career in social work should complete the Social Work Certification Sequence.

The undergraduate major in social welfare is available for those who wish to: 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 other helping service 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 graduation requirements listed earlier in the catalog, 45 credits in social welfare courses are required for the Bachelor of Arts degree with a major in social work.

The following courses must be taken: SW 181, 200, and 344. In addition, Soc 101 and 201, or an acceptable equivalent in the area of social science, must be taken. Students scoring at or above the 93rd percentile on the ACT English examination will be exempt from this requirement. The 200 must pass English 001 before entering English 100. Students who demonstrate in departmental course work standard proficiency in English composition are required to take additional courses in English composition.

The SOCIAL WORK CERTIFICATION SEQUENCE. The Social Work Certification Sequence is a specialized program designed to prepare students for employment as social work practitioners and for graduate education in social work. The certificate is awarded to students upon completion of the requirements for a baccalaureate degree and the following special requirements: SW 181, 200, 340-341, 342, 344, 349; Anthropology 101 and 201; English Composition 110; and Psych 236 or H Ec 265 and 266. In addition to the other requirements for the degree of Bachelor of Arts, students who wish to express a major in social welfare, or those who wish to earn additional credits in social welfare, must pass English 001 before entering English 100. Students who demonstrate in departmental course work standard proficiency in English composition are required to take additional courses in English composition. Those at or below the 31st percentile must pass English 001 before entering English 100. Students who demonstrate in departmental course work standard proficiency may be required to take additional courses in English composition.

SOCIOLOGY
is a science concerned with relationships which link man with his institutions and his society. Sociology is also a profession which offers various service opportunities in 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. The Bachelor of Arts degree must include the following courses: Soc 101, 201, 207, 307, and 314 and Anthropology 135 and 136 and either division anthropology course must be taken. Students planning to undertake graduate work must also take Sociology 205 and 314 and Anthropology 374. Two quarters of English composition must be completed: Students planning to undertake graduate work should also take Sociology 205 and 314 and Anthropology 374. Two quarters of English composition must be completed: Students planning to undertake graduate work should also take Sociology 205 and 314 and Anthropology 374.

COMBINED MAJOR. For the combined major leading to the degree of Bachelor of Arts in Sociology and Economics the following requirements must be completed: Soc 304 and at least 12 additional credits of upper division sociology: Econ 211-212-213, 311, and at least 12 additional upper division credits of economics.
101 INTRODUCTORY SOCIOLOGY.

102 SOCIAL PROBLEMS.

200 AMERICAN SOCIETY. 5 preq 5 credits in sociology or c/i. The major theories of the American society from Toenies to the present. Structure and function of contemporary American society.

201 SOCIAL SCIENCE METHODS. 5 preq 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. (Cred not allowed toward a degree in sociology.)

205 ELEMENTARY SOCIAL STATISTICS. 5 preq Math 601 or exemption by examination and 5 credits in sociology or c/i. Simple statistics and graphical techniques commonly used in the social sciences. Credit not allowed for this course and Psych 230 or BAd 250.

207 INTRODUCTION TO SOCIAL CHANGE. 5 preq 5 credits in sociology or c/i. Analysis of creation and development of social organizations and relationships.

208 SOCIAL PSYCHOLOGY. 5 preq 5 credits in sociology or c/i. The organization of population and land units through processes of change. Simple and complex organization, institutions, and social change.

211 COMMUNITY SOCIOLOGY. 5 preq 5 credits in sociology or c/i. Organization and social relationships of rural life; social structure, heredity, and culture.

213 SOCIOLOGICAL ISSUES. 5 preq 5 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.

215 FIELD OBSERVATION. 3 preq 10 credits in sociology or c/i. Interviewing procedures and social science research; guided experiences in interviewing related to actual research programs.

217 THE COMMUNITY. 3 preq 10 credits in sociology or c/i. The major theories of the community from Toenies to the present with emphasis on the patterns of social organization and change.

218 CULTURE AND PERSONALITY. (See Anthropology)

220 PROBLEMS IN SOCIAL ORGANIZATION. V R-15 preq 15 credits in sociology or c/i. Topics of current interest in sociology.

221 HUMAN ECOLOGY. 3 preq 10 credits in sociology or c/i. The organization of population and land units through processes of social interaction. The spatial patterns of human communities.

222 SOCIOLOGY OF EDUCATION. 3 preq 10 credits in sociology or c/i. A sociological consideration of the structure and operation of the American educational system.

225 SOCIAL SCIENCE METHODS. 5 preq 10 credits in social sciences. The methodology, techniques and instruments of measurement used in the social sciences.

226 ELEMENTARY SOCIAL STATISTICS. 5 preq Math 601 or exemption by examination and 5 credits in sociology or c/i. Simple statistics and graphical techniques commonly used in the social sciences.

227 INTRODUCTION TO SOCIAL CHANGE. 5 preq 5 credits in sociology or c/i. Analysis of creation and development of social organizations and relationships.

228 SOCIAL PSYCHOLOGY. 5 preq 5 credits in sociology or c/i. The organization of population and land units through processes of change. Simple and complex organization, institutions, and social change.

230 SOCIAL SCIENTIFIC PROBLEMS. 5 preq 5 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.

231 COMMUNITY SOCIOLOGY. 5 preq 5 credits in sociology or c/i. Organization and social relationships of rural life; social structure, heredity, and culture.

233 SOCIOLOGICAL ISSUES. 5 preq 5 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.

235 FIELD OBSERVATION. 3 preq 10 credits in sociology or c/i. Interviewing procedures and social science research; guided experiences in interviewing related to actual research programs.

237 THE COMMUNITY. 3 preq 10 credits in sociology or c/i. The major theories of the community from Toenies to the present with emphasis on the patterns of social organization and change.

238 CULTURE AND PERSONALITY. (See Anthropology)

240 PROBLEMS IN SOCIAL ORGANIZATION. V R-15 preq 15 credits in sociology or c/i. Topics of current interest in sociology.

242 INSTITUTIONAL DYNAMICS. 3 preq 15 credits in sociology including 207, or c/i. Interrelationships of institutions in process of change.
SPEECH COMMUNICATION—75

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<td>SpCo 314—Discussion and Small Groups</td>
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<td>SpCo 330—General Semantics</td>
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<td>SpCo 430—Introduction to the Process of Communication</td>
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### 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.

111 INTRODUCTION TO PUBLIC SPEAKING 3. The theories and principles of public speaking. Practice in preparation, delivery and criticism of speeches.

112 ARGUMENTATION 5. The principles by which belief and conduct are influenced through appeals to logical reasoning. Evidence, analysis, logic, fallacies, refutation, rebuttal and their application to current economic, social and political problems.

115 PERSUASIVE COMMUNICATION 4. Attitude and behavior modification primarily by oral communication.

118 ORAL EXPRESSION 3 (2-3). Principles of vocal expression, articulation and diction, with practical application through recording and evaluation.

223 (123) PUBLIC SPEAKING PRACTICUM 2 (0-4) prereq 111. Practice in preparation, delivery and criticism.

233 INTRODUCTION TO THE PROCESS OF COMMUNICATION 5 (0-5). Major concepts and principles relevant to the nature and use of signs and symbols in the total process of communication.

265 FORENSICS 1 R-6. Preparation of debates, orations, extemporaneous and impromptu speeches, and other types of public address.

387 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 relevant to the concepts of leadership, communication patterns, group cohesion and social pressure.

316 COMMUNICATION IN ORGANIZATIONS 4. Theory and research on questions of interorganizational communication problems.

333 GENERAL SEMANTICS 3. The influence of language and language habits on perception, evaluation and decision; particular attention to the concepts of structure and meaning.

335 MESSAGE COMPOSITION 3. The influence of language and language habits on perception, evaluation and decision; particular attention to the concepts of structure and meaning.
556 SPEECH CRITICISM 3. The bases upon which the various forms of public speaking are evaluated.

361 (361) ORAL INTERPRETATION 3 (2-3). The analysis and oral presentation of literature.

371 SOCIODRAMA 3. Principles and practice of role-playing as a technique of communication.

382 LANGUAGE AND CULTURE 3 prereq 119 and c/i. Analysis of relationships between language and cultures of the world. (Same as Anth 383; credit not accepted for both.)

FOR UNDERGRADUATES AND GRADUATES

422 (421) TEACHING SPEECH IN THE SECONDARY SCHOOL 3 prereq 15 credits in Speech Communication. Planning the speech curriculum and its relationship to other school subjects; instructional materials and methods of teaching speech. Same as Educ 452.

424 METHODS OF TEACHING COMMUNICATION SKILLS 3 prereq c/i. Same as Education 424.

430 BUSINESS AND PROFESSIONAL INTERVIEWING 3. Theory and practice of communication behavior in dyadic situations as confronted in business, education, and professions. Experience in informational, employment, and decision-making interviews.

443 (343) ADVANCED PUBLIC SPEAKING 3 prereq 111 and 355 or c/i.

444 (344) RHETORICAL THEORY 3. The historical development and current status of rhetorical theory.

445 HISTORY OF AMERICAN PUBLIC ADDRESS 3 prereq c/i. Critical analyses of speeches of historically prominent American speakers and issues with which they were identified.

446 CONTEMPORARY PUBLIC ADDRESS 3. Critical analysis of techniques of recent speakers and the issues with which they are identified.

451 PSYCHOLINGUISTICS 3 a/y prereq 234. Recent theories and evidence concerned with the empirical analysis of linguistic behavior.

452 DIRECTING THE FORENSIC PROGRAM 3. Philosophy, organization, and administration of competitive speech activities.

469 (369) ADVANCED ORAL INTERPRETATION 3 prereq 361 or c/i.

475 NONVERBAL HUMAN COMMUNICATION 3, prereq c/i. Codes and message systems classified as nonverbal, including kinesics, cultural, spatial, temporal.

480 LINGUISTIC METHODS 3. (See Anthropology.)

490 PROBLEMS V R-6.

497 INTRODUCTION TO GRADUATE AND PROFESSIONAL PROGRAMS 2 prereq 15 credits of junior and senior level Speech Communication or c/i. The basic approaches to graduate and professional activities.

FOR GRADUATES

511 THEORIES OF COMMUNICATION 3 prereq c/i. A critical evaluation of theories and research in the field of communication.

512 ORGANIZATIONAL COMMUNICATION 3 prereq c/i.

514 SMALL GROUP COMMUNICATION 3 prereq c/i.

519 SEMINAR: COMMUNICATION MEASUREMENT 3 prereq Statistics.

521 INFORMATION AND COMMUNICATION 3 prereq c/i. The nature and function of information in human communication systems.

522 SEMINAR: SPEECH COMMUNICATION EDUCATION 3. prereq 422 or c/i.

533 SEMINAR: LANGUAGE BEHAVIOR 3, R-6, prereq c/i.

541 PERSUASION 3 prereq c/i. 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 prereq c/i.

551 CONTEMPORARY MESSAGE STRATEGIES 3 a/y prereq c/i.

553 SEMINAR: RHETORIC AND PUBLIC COMMUNICATION 3 a/y prereq c/i.

571 SOCIODRAMA 3 a/y c/i.

588 COMMUNICATION PRACTICES 3. (See Business Administration.)

597 RESEARCH METHODS AND MATERIALS 5 prereq Statistics. Principles and techniques of quantification and design in communication research. Practice in the techniques of professional writing.

599 TOPICAL SEMINAR V R-9 prereq c/i.

600 RESEARCH V R-10 prereq c/i.

699 THESIS V R-12.

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SPEECH PATHOLOGY AND AUDILOGY 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 pre-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 listed earlier in this 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 must complete a core curriculum as follows: Speech Pathology and Audiology 100, 101, 119, 232, 235, 337, 338, 341, 381, 382, 383, 384, 385, 386, 400, 400 level 9 additional credits; Anthropology 152 or 153; English 450 or Speech Communication 385; Sociology 101; Psychology 110 and 280; Speech Communication 111; Zoology 202; 5 credits each in Child Development, Philosophy and Statistics; 6 credits other than 111 and 385 in Speech Communication.

SUGGESTED PROGRAM FOR UNDERGRADUATES

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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 does not offer a degree in linguistics, a concentration in linguistics, or a minor in linguistics 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. Refer to the Departments of Anthropology, English, Foreign Languages, Psychology, Communication, and Speech Pathology and Audiology for course offerings in linguistics.

GRADUATE WORK. See Graduate Bulletin.

FOR UNDERGRADUATES

100 ORIENTATION TO SPEECH PATHOLOGY AND AUDIOLOGY I 1 (1-1) prereq c/i. 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) prereq SPA 100. Principles of observation and reporting 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.

232 INTRODUCTION TO COMMUNICATION 5 (4-2). Physiological, psychological, sociological, and cultural determinants of the production and reception of signs in human communication.

235 COMMUNICATION DISORDERS I 5 (5-1) prereq 119, 225. Theories, research and selected remedial procedures relating to receptive and expressive aspects of disorders of articulation and voice.

236 COMMUNICATION DISORDERS II 5 (5-1) prereq 235. Theories, research and selected remedial procedures relating to disorders of language, rhythm and fluency.

330 INTRODUCTION TO SPEECH PATHOLOGY 3 (3-1). For non-majors. Speech sound problems commonly encountered in the classroom. (Non-majors may take for graduate credit.)

377 COMMUNICATION DISORDERS III 3 (3-1). Psychosocial problems of communication including those language problems associated with infantile autism, psychotic conditions, and socio-cultural differences between speakers and listeners.

380 CLINICAL PROCEDURES FOR COMMUNICATION DISORDERS 3 (3-1) prereq 344. Clinical experience with tools and techniques needed to assess and diagnose speech and hearing problems of the adult and child.

382 CLINICAL DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS I 2 (1-3) prereq 344. Supervised clinical practice in the out-patient clinic.

391 DEVELOPMENTAL SEMIOLOGY 3 prereq SPA 119, 225. Characteristics and determinants of the sign process associated with the main stages in human development through the life span.

398 CLINICAL AUDIOLOGY 3 (3-1) prereq 222. Principles and methods of habilitation and rehabilitation for children and adults with communication disorders.

399 DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS II 2 (4-4) prereq 391. Supervised clinical practice in the Speech and Hearing Clinic.

419 ADVANCED PHONOLOGY 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.

433 CLINICAL PRACTICUM I 1-3 (2-2) R-4 prereq 338 and 341. Twenty clock hours per credit of supervised clinical practice in the Speech and Hearing Clinic.


457 PSYCHOLINGUISTICS 3 a/y prereq SpCo 234 and Engl 360. Research 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 prereq Zool 111-112-113 or c/i. The sign process based on evidence and observation at selected levels of the phyletic scale.

491 DIAGNOSTIC AUDIOLOGY 3 (3-1) prereq 380. Special audiometric procedures used in otological diagnosis, pediatric audiology, hearing conservation in schools, professional issues in audiology.

492 REHABILITATION OF THE HEARING HANDICAPPED 3 (3-1) prereq 380. Speech reading, auditory training, hearing aid fitting and evaluation, speech habilitation and conservation in children and adults; relationships with education and vocational counseling.

495 INTRODUCTION TO GRADUATE AND PROFESSIONAL PROGRAMS 3 prereq 15 credits of junior and senior level Speech Pathology and Audiology or c/i. The basic approaches to graduate and professional activities.

FOR GRADUATES

500 RESEARCH V R-10 prereq c/i.

513 PSYCHOACOUSTICS 3 a/y prereq c/i. Current research relating to the basic physical variables of speech and hearing and to the processes of speech and analysis and synthesis.

515 SEMINAR: LABORATORY AND CLINICAL INSTRUMENTATION 3 prereq c/i.

523 ADVANCED CLINICAL PRACTICUM IN COMMUNICATION DISORDERS V (6-2) R-6 prereq 4 credits of 428.

528 PRACTICUM IN SCHOOL SPEECH AND HEARING THERAPY IV (6-2) R-9 prereq 435.

537 SEMINAR: STUTTERING RESEARCH AND THEORIES 3 prereq c/i.

538 SEMINAR: ANATOMIC DEFECTS OF SPEECH 3 prereq c/i.

539 SEMINAR: NEUROMUSCULAR DEFECTS OF SPEECH 3 prereq c/i.

541 SEMINAR: TEST ADMINISTRATION AND INTERPRETATION FOR COMMUNICATION PATHOLOGIES 3 c/i.

547 ADVANCED DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS 2 (1-3) R-6. Supervised practicum in diagnostic clinics.

548 SEMINAR: LANGUAGE DISORDERS 3 prereq c/i.

550 SEMINAR: MEDICAL ASPECTS OF COMMUNICATION DISORDERS 3 c/i. Discussion of the medical aspects of communication disorders with participation of a number of medical specialists.

553 ADVANCED CLINICAL AUDIOLOGY 3 (3-1) prereq 481. Noise measurement, exposure, and control; hearing conservation in industrial, architectural-acoustics survey; experimental clinical procedures; administrative aspects of audiological services.

556 INSTRUMENTATION FOR AUDITORY REHABILITATION 3 (3-1) prereq 467. Recent research relating to experimental uses of amplification. Theory and practice in the design, construction, and application of hearing aids, portable amplifiers, auditory training units, and institutional audiovisual instrumentation.

557 SEMINAR: MEASUREMENT OF HEARING 3 (3-1) prereq c/i.

558 SEMINAR: REHABILITATION OF THE HEARING IMPAIRED 3 (3-0) prereq c/i.

559 SEMINAR: HEARING CONSERVATION PROGRAMS 3 prereq c/i.

560 (599) TOPICAL SEMINAR V R-9 prereq c/i.

599 Thesis V R-12.
### WILDLIFE BIOLOGY

is the study of wild vertebrate animals, their habitats, and their conservation. The undergraduate curriculum described herein, constitute preprofessional training for future employment in fish and game conservation, and provides an excellent background in general ecology.

Very few employment opportunities exist in wildlife management or 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 most state and federal wildlife management and/or research positions.

There are three optional curricula in the Wildlife Biology program: Terrestrial, Aquatic, and Honors. The Terrestrial and Aquatic options follow the same schedule of courses for the freshman and most of the sophomore year, and then pursue different curricula for the next two years. Each leads to the Bachelor of Science in Wildlife Biology. The Wildlife Honors curriculum is designed particularly for students with strong academic records who intend graduate work. Entrance into this option is open only to students at the beginning of their junior year who have a 3.0 G.P.A. and who petition the faculty sponsor.

This university is particularly well suited for instruction in Wildlife Biology because of the excellent opportunities for field instruction and research, and the presence of such facilities as the Biological Station, Montana Forest and Conservation 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, and at least one year each of biology and chemistry.

### 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. A major knowledge of a modern foreign language may be required for Honors students electing preparation for graduate work leading to a doctorate. Candidates for all options should use at least 30 of the elective credits provided for in the curriculum for coursework other than science or mathematics.

### WILDLIFE BIOLOGY

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
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<tbody>
<tr>
<td>Bot-Zool 111—General Biology</td>
<td>A</td>
</tr>
<tr>
<td>Botany 114, 115—General Botany</td>
<td>W</td>
</tr>
<tr>
<td>*Chem 101, 105, 109—General, Organic</td>
<td>S</td>
</tr>
<tr>
<td>Chem 104, 105, 109—Lab</td>
<td>A</td>
</tr>
<tr>
<td>**Math 107, 108, 109—Math for Biological Sciences</td>
<td>W</td>
</tr>
<tr>
<td>Zool-Bot-For 170—Survey of Wildlife Careers</td>
<td>S</td>
</tr>
<tr>
<td>Engl 100—Lower Division Composition</td>
<td>A</td>
</tr>
<tr>
<td>Electives</td>
<td>0-3</td>
</tr>
<tr>
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<td>15-18</td>
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### TERRESTRIAL OPTION

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zoology 113, 112—General Zoology</td>
<td>A</td>
</tr>
<tr>
<td>Botany 236, 238—Plant Physiology, Local Flora</td>
<td>W</td>
</tr>
<tr>
<td>SFCO 111—Introduction to Public Speaking</td>
<td>S</td>
</tr>
<tr>
<td>Bot-Zool 250—Basic Concepts of Ecology</td>
<td>A</td>
</tr>
<tr>
<td>Bot-Zool 251—Ecology Lab</td>
<td>S</td>
</tr>
<tr>
<td>Phys 111, 112 or 113—General Physics</td>
<td>S</td>
</tr>
<tr>
<td>Electives</td>
<td>0-3</td>
</tr>
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### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Zool 369, 368—Mammalogy, Ornithology</td>
<td>A</td>
</tr>
<tr>
<td>Zool 330, 331—Cellular Physiology, Comp. Phys.</td>
<td>W</td>
</tr>
<tr>
<td>Forestry 360—Range Management</td>
<td>S</td>
</tr>
<tr>
<td>Math 125 or Math 244, 246—Statistical Methods</td>
<td>0-3</td>
</tr>
<tr>
<td>Forestry 220 or Jour 334—Technical Writing</td>
<td>0-3</td>
</tr>
<tr>
<td>Electives</td>
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<td>15-17</td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>For 470, 471, 472—Adv. W.L., Big Game, Habitat</td>
<td>A</td>
</tr>
<tr>
<td>Botany 355—Plant Ecology</td>
<td>W</td>
</tr>
<tr>
<td>Zoology—Population Ecology</td>
<td>S</td>
</tr>
<tr>
<td>Zoology 360—Community Ecology (Recommended)</td>
<td>A</td>
</tr>
<tr>
<td>Zoology 465—Animal Behavior</td>
<td>S</td>
</tr>
<tr>
<td>Zool-Bot-For 491, 492, 493—Senior Wildlife Sem.</td>
<td>A</td>
</tr>
<tr>
<td>Electives</td>
<td>0-7</td>
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</table>

### AQUATIC OPTION

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Zool 113, 112—General Zoology</td>
<td>A</td>
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<tr>
<td>Botany 235—Plant Physiology</td>
<td>W</td>
</tr>
<tr>
<td>SFCO 111—Introduction to Public Speaking</td>
<td>S</td>
</tr>
<tr>
<td>Bot-Zool 250—Basic Concepts of Ecology</td>
<td>A</td>
</tr>
<tr>
<td>Bot-Zool 251—Ecology Lab</td>
<td>S</td>
</tr>
<tr>
<td>Math 125 or Math 344, 345—Statistical Methods</td>
<td>3-5</td>
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<tr>
<td>Phys 111 and 112 or 113</td>
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<tr>
<td>Electives</td>
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<tr>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zool 310—Ichthyology</td>
<td>A</td>
</tr>
<tr>
<td>Chemistry 245, 246—Quantitative Analysis, Lab</td>
<td>S</td>
</tr>
<tr>
<td>Botany 355—Plant Ecology</td>
<td>A</td>
</tr>
<tr>
<td>Botany 265—Local Flora</td>
<td>S</td>
</tr>
<tr>
<td>Forestry 385—Hydrologic Principles</td>
<td>4</td>
</tr>
<tr>
<td>For 220 or Jour 334—Technical Writing</td>
<td>0-3</td>
</tr>
<tr>
<td>Electives</td>
<td>0-9</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoology 366—Aquat. Insects</td>
<td>A</td>
</tr>
<tr>
<td>Zoology 422—Fisheries Science</td>
<td>W</td>
</tr>
<tr>
<td>Zoology 350—Population Ecology (Recommended)</td>
<td>S</td>
</tr>
<tr>
<td>Zoology 360—Community Ecology</td>
<td>0-3</td>
</tr>
<tr>
<td>Zoology 465—Animal Behavior</td>
<td>0-3</td>
</tr>
<tr>
<td>Zool-Bot-For 491, 492, 493—Senior Wildlife Sem.</td>
<td>1-1</td>
</tr>
<tr>
<td>Electives</td>
<td>0-5</td>
</tr>
<tr>
<td></td>
<td>16-16</td>
</tr>
</tbody>
</table>

### WILDLIFE HONORS OPTION

Honors students must complete either For 470, 471, 472 or Zool 310, 366, and Zoology 414 and Bot-Zool-For 491, 492, 493. Honors students may enroll in Bot-Zool-For 494, Senior Thesis. The balance of the coursework for the junior and senior years will be developed in consultation with the Honors student's faculty sponsor.

All students in the Honors Option are required to meet with their faculty sponsors prior to fall registration of their Junior and Senior years to work out their course schedules.

Appropriate courses for Aquatic and Terrestrial Wildlife students to select from in addition to those above include: Bot 366, 370, 428; Comp Sci 301, 302, Econ 211, 212; For 310, 310, 320, 351, 351, 380, 410, 480, 480, 480, 480, 501, 482, 485; Geog 360, 370; Geol 101, 102, 200, 200, 260; Math 346, 399; Pol Sci 362; Zool 303, 304, 404.

Students desiring more thorough preparation in Chemistry should elect Chem 121, 122, 223, 224, 310.

**Students desiring more thorough preparation in mathematics should elect Math 121, 122, 221, 310, 311.

### 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.
FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

Courses also offered at Biological Station (*Courses only at Biological Station): 358, 359, 369, 371, 374, 382, 434, 436, 461, 500, 509

111 INTRODUCTION TO BIOLOGY 5 (3-4). Basic principles of biology, including aspects of cell structure and metabolism, genetics, origin of life, and mechanics 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.)

131 INTRODUCTION TO BIOLOGICAL SCIENCE 4 (3-2). The basic principles of biology, including aspects of metabolism, mechanics, genetics, origin of life, and mechanics of evolution and adaptation. (Offered especially for non-majors in Botany, Microbiology or Zoology. Credit not allowed for this course and Botany or Zoology 111.)

172 EVOLUTION, GENETICS AND MAN 3 prereq Gen 131 or =. Evolution, especially as related to man and including evidence, mechanisms, genetics, origin of hereditary material and adaptation. Not counted toward a major in Botany, Microbiology or Zoology.

Survey of wildlife careers 1-3 (same as Forestry Bot 170). 202 HUMAN PHYSIOLOGY 5 (3-4) prerequisites standing with at least one science course or two quarters of college zoology. The normal physiology of blood circulation, respiration, digestion, excretion and reproduction. (Credit not allowed for this course and Bot 202.)

206 FIELD ZOOLOGY 3 (2-5) prereq 113. Collection, identification and preservation of animals. Field work.

260 (360) BASIC CONCEPTS OF ECOLOGY 3 (3-4) prereq one year of college biology. Ecosystem principles with emphasis on the ecosystem. (Credit not allowed for this course and Bot 260.)

251 ELEMENTARY ECOLOGY LABORATORY 2 (1-0) prerequisites, 110. Population growth and community structure and interrelationships with environmental factors. Field work included. (Credit not allowed for this course and Bot 251.)

FOR UNDERGRADUATES AND GRADUATES

201 GENERAL COMPARATIVE EMBRYOLOGY 5 (3-4) a/y prereq 325, 329. The early stages of development of the invertebrates and vertebrates, including meiosis, fertilization, cleavage, formation of the germ layers and early organogenesis.

203 ANIMAL PARASITOLOGY 5 (3-4), a/y prereq Zool 112-113. Parasitism as a biological phenomenon, origin of parasitism, adaptations and life cycles, parasites and their environment, host-parasite interrelationship, and parasite metabolism will be emphasized.

204 COMPARATIVE VERTEBRATE ANATOMY 5 (3-4) prereq 113. The comparative morphology of the vertebrates.

205 ANIMAL MICROTECHNIQUE 5 (2-6) prerequisites Bot 111, Bot 112, Bot 113. Preparation of organs and squashes with emphasis upon the flora and invertebrate fauna, with some consideration of their relationship to the food chains and habitats of aquatic vertebrates. (Credit not allowed for this course and Bot 205.)

206 PHYSIOLOGY 5 (3-4) prerequisites, 113. The normal physiology of blood circulation, respiration, digestion, excretion, irritability, locomotion, coordination, and reproduction. (Credit not allowed for this course and Bot 206.)

207 AQUATIC BIOLOGY 5 (3-7) prerequisites Bot 206 or 365 and Bot 255. The biology of fresh water bearing on the flora and fauna with emphasis upon the flora and invertebrate fauna, with some consideration of their relationship to the food chains and habitats. Field work included. (Credit not allowed for this course and Bot 207.)

208 ORNITHOLOGY 5 (3-6), Su 6 at Biological Station, prereq 113. The structure, classification and life histories of birds. Weekly field trips. Students are expected to provide themselves with binoculars.

209 MAMMALOLOGY 5 (3-4), Su 4 at Biological Station, prereq 113. The classification, identification and life histories of mammals. Weekly field trips.

210 ICHTHYOLOGY 5 (3-4) prereq 113. The systematic and distribution of the more important orders of fish, their collection and identification. Life histories and certain fundamentals of the physiology of fish are considered. Field trips.

213 (395) VERTEBRATE HISTOLOGY 5 (3-4) prereq 113. Basic animal cytology, tissue types and organology are studied. May be taken concurrently with 395.

213 (396) PROTOZOOLOGY 5 (3-4) prereq 113. Taxonomy, structure, natural history, physiology, and ecology of protozoans.

214 INVERTEBRATE BIOLOGY I 5 (3-4) prereq 112. Structure, function, phylogeny, and general biology of the lower invertebrates.

215 INVERTEBRATE BIOLOGY II 5 (3-4) prereq 112. Structure, function, phylogeny and general biology of the higher invertebrates.

229 BIOLOGICAL LITERATURE 1 (2-0) prerequisites 20 credits in Biology or Zoology. Student reports of literature of the trend of investigation and experimentation in biological fields.

230 CELLULAR PHYSIOLOGY 5 (3-4) prerequisites two courses in Physics, Chem 212, 215, or 160, 164, one course in Botany, Microbiology or Zoology. The life processes. In addition to the general processes at the cellular level emphasizing the methods of the physical sciences. Jointly listed as Botany 350.

231 COMPARATIVE PHYSIOLOGY 5 (3-4) prereq 330. The physiology of the major animal phyla. Special attention is paid to those functions related to the environment.

340-341 MAMMALIAN PHYSIOLOGY 5 (3-4) prereq 113 and three quarters of college chemistry, including labs. (346) General physiological properties of protoplasm: blood, body fluids, respiration, and excretion. (341) Digestion, nutrition and metabolism; excretion. (341) Rev. 3-4 hours. Each.

350 POPULATION ECOLOGY 5 (3-4) prerequisites, 111, 112, 113, 250. College Calculus, Statistics. The dynamics of animal populations including mechanisms for density dependence, populations, patterns of population change and population models.

360 COMMUNITY ECOLOGY 5 (3-4) prerequisites, 111, 112, 113, 250. College Calculus, Statistics. The structure and function of communities including reproduction, food webs, nutrient cycling, diversity and stability.

365 ENTOMOLOGY 5 (3-4) Su 6 at Biological Station, prereq 113. The structure, classification, life histories, distribution and ecology of insects.

ZOOLOGY-79
436 AQUATIC INSECTS 4 (3-12) prereq 113. The insect fauna, both immature and adult, in aquatic habitats of Western Montana.

438 BIOLOGICAL ILLUSTRATIONS 2 (0-4) prereq 1 year of biology and c/i. Basic principles and skills of producing illustrative materials relevant to the biological sciences. (85 special supplies fee. Credit not allowed for this course and Bot 403.)

439 (302) VERTEBRATE EMBRYOLOGY 5 (2-4) prereq 304. The early stages of development of the vertebrates including organogenesis, with emphasis on birds (chick) and mammals (pig).

440 ANIMAL BEHAVIOR 5 (3-4) prereq 25 credits in Zoology or c/i. Normal behavior of animals under natural conditions, description, adaptiveness, and evolution. Observation and recording of animal behavior.

413 FISHERY SCIENCE 3 (3-6) prereq 307, 310. The problems involved in inventory and fisheries biology with an analysis of, and some actual field experience in, methods employed in attacking these problems. Field trips.

431 PROBLEMS IN VERTEBRATE MORPHOLOGY AND TAXONOMY 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.

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 ECOLOGY 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.

434 PROBLEMS IN INVERTEBRATE MORPHOLOGY AND TAXONOMY 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.

435 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.

436 PROBLEMS IN INVERTEBRATE ECOLOGY 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.

437 CYTOLOGY 5 (3-4) prereq one year Biology, Chem 160, 164. Same as Botany 437.

442 BIOLOGY OF FOREST INSECTS 3 (3-0) prereq Zool 113. Biology and bioeconomics of insects, including structure, function, systems, physiology, and genetics, leading to consideration of insect ecology.

443 FOREST INSECT ECOLOGY 3 (3-0) prereq Zool 432. Ecological role of insects significant in the total forest ecosystem; factors which regulate the distribution and abundance of insects; the bioeconomics and bioeconomics of insects. Special emphasis on vertebrates. Field trips.

450 MARINE INVERTEBRATES 3 (1-8) prereq 436, a problem course in biology of the systematics and ecology of marine invertebrates with particular reference to habitat niche of the animals of the Pacific Coast. (A 5-day trip to coast of Oregon or Washington required.)

461 LIMNOLOGY 6 (5-25) prereq 113 and Chem 123, 126. Ecology of lakes, streams and ponds, with emphasis on the physical, chemical and biotic factors which determine their biological productivity.

485 (355) GENETICS 5 (3-4) prereq 113 or Bot 225. The mechanism of heredity, involving consideration of Mendelian inheritance, linkage systems, chromosomal aberrations, extra-chromosomal inheritance, and their relationship to structure and function. Credit not given for both Zool 485 and Bot 485.

486 (386) EVOLUTION. (See Botany.)

487 CYTGENETICS 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. Same as Botany 487.
CROWLEY, JOHN
CRoss, COPELAND, SANDRA KAY, M.S.,
CARD, George L., Ph.D., University of Nebraska; Assistant Professor of Microbiology
CARTER, ACE H. (Mrs.), B.A., University of Colorado; Instructor in Music (part-time)
CARY, Donald A., M.M.E., University of Kansas, Assistant Professor of Music
CATLET, LINUS J., Ed.D., University of Oregon; Professor Emeritus of Education
CAPTNER, James C., M.A., Vanderbilt University; Instructor and Research Assistant in Foreign Languages
CARSON, H. M., State University of Iowa; Lecturer in Speech Pathology and Audiology (Faculty Affiliate)
CARMICHAEL, CHARLES E., B.A., Drake University; Instructor in Education (part-time)
CERNO, Richard M., New York University; Clinical Instructor in Physical Therapy, Health, Physical Education and Recreation (Faculty Affiliate)
CHANDLER, WALTER R., Ph.D., Indiana University; Associate Professor of Sociology; Research Associate, Institute for Urban and Regional Development
CHAPMAN, DONALD H., Ph.D., University of Montana; Professor Emeritus of Psychology
CHAPMAN, JOHN EMMONS, Ph.D., University of Washington; Associate Professor of History
CHAPMAN, ROBERT E., M.A., Baylor University
CLAY, MAURINE, University of Nebraska; Assistant Professor of Microbiology
CLARK, ROBERT E., M.A., Stanford University; Professor of Psychology
CLary, RICHARD A., Ph.D., Purdue University; Assistant Professor of Business Administration (Management) (on leave, 1-7-70 to 6-30-72)
Dietz, REUBEN A., Ph.D., State University of Iowa; Professor of Botany
Dew, JAMES E., M.A., Oberlin College; Professor of Art (Sabbatical leave, Winter and Spring Quarters)
Dew, William D., Ph.D., North Carolina State University; Associate Professor of Business Administration (Management) (on leave, 1-71 to 6-71)
Dyer, William E., Ph.D., Harvard University; Associate Professor of English
Dyer, Richard R., Ph.D., University of California, Berkeley; Assistant Professor of History
Drake, ROBERT L., M.S.W., University of Utah; Assistant Professor of Sociology and Social Welfare
Drew, MARK F., M.A., University of Oregon; Associate Professor of English
Dray, JAMES D., LL.B., University of Montana; Lecturer in Management (Business Administration (Management) (part-time))
Duck, RICHARD J., Ph.D., Northwestern University; Director and Associate Dean of Faculty of Liberal Arts and Sciences
Doty, GERALD E., Ph.D., Indiana University; Professor of Music
Doty, JACK H., M.B.A., Harvard University; Professor of Business Administration
Douglas, PATRICIA F. (Mrs.), Ph.D., University of California, Berk­ley; C.P.A., Montana; Research Associate in the Bureau of Business and Economic Research; Assistant Professor of Business Administration (Accounting and Finance)
Dow, LOIS A. (Mrs.), M.A., University of Minnesota; Assistant Professor of History
Dowler, ROBERT R., Ph.D., University of California; Assistant Professor of History
Dreyer, Jon J., Ph.D., University of Colorado; Assistant Professor of Sociology; Research Associate, Institute for Social Science Research
Dugan, Edward B., M.A., University of Missouri; Professor of Jour­nalism
Duks, VICTOR, H., Ph.D., University of Utah; Professor of Pharmacy
Dunsmore, ROGER J., M.A., Pennsylvania State University; Instructor in Humanities
Eastman, ELIZABETH B.A., University of Montana; Research Associate in Bureau of Government Research (part-time)
Eck, Laurence J., J.D., University of Montana; Visiting Assistant Professor of Management
Egeland, Lee E., B.A., Colorado State University; Assistant Professor of Forestry
Eitel, But­ler R., M.M., MacPhail College of Music; Professor of Music
Eitel, FRISCILLA (Mrs.), B.M., Eastman School of Music; Lecturer in Music (part-time)
Ellen, C.A., M.D., University of Minnesota; Lecturer in Virology, Department of Microbiology (Faculty Affiliate)
Ellson, LARRY M., S.J.D., University of Michigan; Professor of Law (Sabbatical leave, second semester)
Ellis, JOHN C., M.M., University of Montana; Instructor in Music
Elway, JOHN A., M.S., Washington State University; Assistant Foot­ball Coach
Emmons, Donald J., Ph.D., Columbia University; C.P.A., Montana; Professor of Accounting and Finance (Business Administration)
Emmons, David M., Ph.D., University of Colorado; Assistant Professor of History
Enghold, ESTHER L., B.A., University of Montana; Visiting Instructor in Voice, Music
Emerson, Miranda G. (Mrs.), M.A., University of Montana; Professor of Foreign Languages
Emerson, RONALD E., Ph.D., State University of Iowa; Professor of Chemistry
Evans, John W., Ph.D., University of Texas; Chairman of Sociology and Social Work; Professor of Sociology
Evans, William B., Ph.D., University of Washington; Associate Professor of History
Evans, CATHARINE M. (Mrs.), B.S., Oregon State University; Assistant in Home Economics (part-time)
Fahey, WILLIAM E., Ph.D., University of Washington; Assistant Professor of History
Faubon, James L., M.F., University of Washington; Associate Professor of Forestry
Faulk, Richard A., Ph.D., Purdue University; Associate Professor of Microbiology
Ferguson, Robert R., Ph.D., Michigan State University; Dean of Students; Associate Professor of Education
Fenlen, Michael P. (Capt.), B.S., United States Military Academy, West Point; Associate Professor of Military Science (Faculty Affiliate)
Management (Business Administration)

JOHNSON, JOHN

JEPPESEN, RANDOLPH

KARLIN, JULES A., Ph.D.

JOHNSON, PHOEBE

JOHNSON, AGNES FAHY

KITTREDGE, WILLIAM A., M.F.A.

JOHN P., Ph.D.

Yale University; Professor Emeritus of English

KING, WALTER N., Ph.D., Yale University; Professor of Psychology

KIRK, WALTER, Ph.D., University of South Dakota; Assistant Professor of Microbiology

KNOX, EDWARD S., M.S.F., University of Michigan; Research Associate in Forestry (Faculty Affiliate)

KRIEGER, JOHN, Ph.D., Yale University; Division Coordinator and Professor of Forestry

KRIEGER, JOHN A. (Major), B.S., University of Santa Clara; Associate Professor of Foreign Languages (Faculty Affiliate)

KRUKEBERG, ROBERT F., M.S.; Yale University; Research Associate in Forestry (Faculty Affiliate)

LACKEY, LAWRENCE, B.S., University of Michigan; Professor of Forestry (Faculty Affiliate)

LACKMAN, DAVID B., Ph.D., University of Pennsylvania; Lecturer in Foreign Languages (Faculty Affiliate)

LACKSCHWITZ, GERTRUD (Mrs.), Ph.D., Goettingen University (Germany), Associate Professor of Foreign Languages

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