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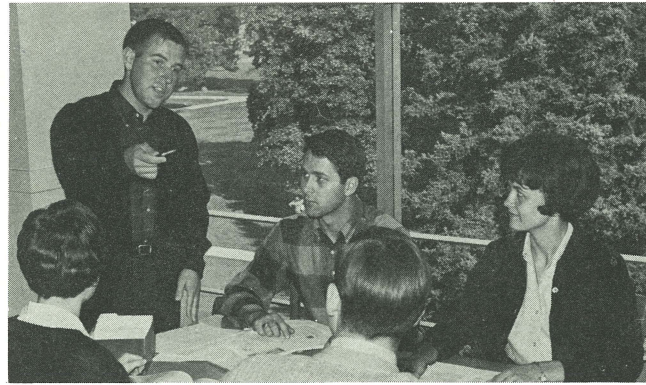
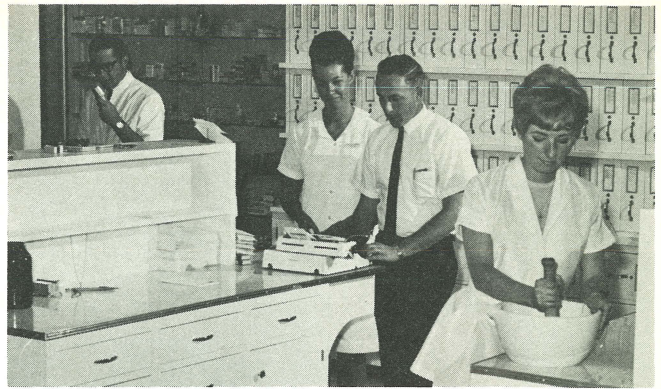
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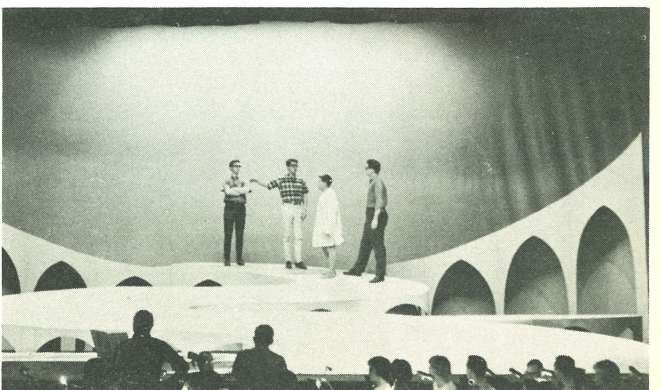
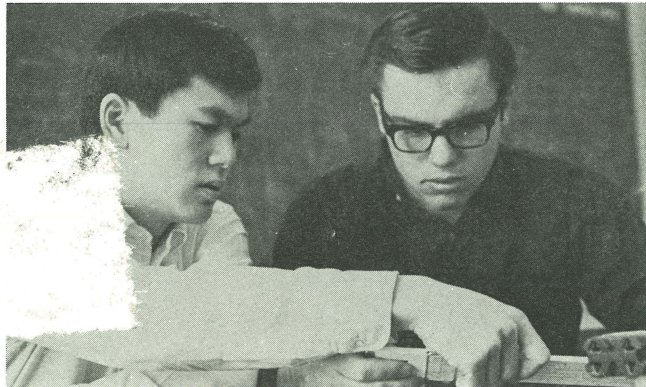
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UNIVERSITY OF MONTANA BULLETIN



1968-69
CATALOG
ISSUE

UNIVERSITY OF MONTANA
MISSOULA, MONTANA 59801
MAY, 1968

the montana university system . . .

The Montana University System is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, approved March 14, 1913 (effective July 1, 1913). The general control and supervision of the University System are vested in the State Board of Education, ex-officio Regents of the Montana University System. For each of the component institutions there is a local executive board.

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The University System comprises the following institutions, schools, and departments:

UNIVERSITY OF MONTANA, MISSOULA
Established February 17, 1893, and consisting of

The College of Arts and Sciences	The Biological Station (Flathead Lake)
The School of Law	The Bureau of Business and Economic Research
The School of Pharmacy	The Forest and Conservation Experiment Station
The School of Forestry	The Lubrecht Experimental Forest
The School of Journalism	The Division of Extension and Public Service
The School of Business Administration	The Montana Cooperative Wildlife Research Unit
The School of Education	
The School of Fine Arts	
The Summer Session	
The Graduate School	

Robert T. Pantzer, President

MONTANA STATE UNIVERSITY, BOZEMAN
Established February 16, 1893, and consisting of

The College of Agriculture	The Central Montana Branch Station (Moccasin)
The College of Education	The Eastern Montana Branch Station (Sidney)
The College of Engineering	The Huntley Branch Station (Huntley)
The College of Letters and Science	The North Montana Branch Station (Havre)
The College of Professional Schools	The Northwestern Branch Station (Creston)
School of Architecture	The U. S. Range Station (Miles City)
School of Art	The Western Montana Branch Station (Corvallis)
School of Home Economics	The Engineering Experiment Station
School of Nursing	The Cooperative Extension Service
The College of Graduate Studies	Water Resources Research Center
The Summer Quarter	Community Services
The Division of Student Affairs and Services	
The Agricultural Experiment Station	
The Montana Grain Inspection Laboratory	
The Montana Wool Laboratory	

Leon H. Johnson, President

MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY, BUTTE
Established February 17, 1893, and consisting of

The Curriculum in Mining Engineering	The Curriculum in Engineering Science
The Curriculum in Metallurgical Engineering	The Curriculum in Geophysical Engineering
The Curriculum in Mineral Dressing Engineering	The Graduate School
The Curriculum in Geological Engineering	The Bureau of Mines and Geology Summer Field Courses
The Curriculum in Petroleum Engineering	Pre-Professional Courses

E. G. Koch, President

WESTERN MONTANA COLLEGE, DILLON
Established February 23, 1893, and consisting of

The Four-year Course in Teacher Education, Elementary and Secondary	The Two-year Course in Business Education
The Summer Quarter	The Two-year General College Course and Pre-Professional Courses
The Teacher Service Division	
The Graduate Division	

James E. Short, President

EASTERN MONTANA COLLEGE, BILLINGS
Established March 12, 1927, and consisting of

The School of Liberal Arts	The School of Education—Elementary, Secondary and Special
Division of Humanities	The Graduate Division
Division of Science and Mathematics	The Pre-Professional Program
Division of Social Science	The Summer Session

Stanley J. Heywood, President

NORTHERN MONTANA COLLEGE, HAVRE
Established March 8, 1929, and consisting of

The Four-year Course in Teacher Education, Elementary, Secondary and Vocational-Technical	The Two-Year Program in General Studies and the Pre-Professional Courses
The Three-Year Associate Degrees Program in Engineering Technology	The One- and Two-Year Courses in Vocational-Technical Program
The Two-Year Associate Degree Program in Nursing	The Summer Quarter

Joseph R. Crowley, President

purpose of the catalog . . .

The catalog provides information to be used by prospective students, their parents, their teachers, and advisers; by college students, faculty members, and administrative officers; by registrars and accrediting agencies. It also provides a historical record.

The catalog is planned to furnish the prospective student with information needed for selecting a school and making long-range educational plans leading to a chosen career. Students without well defined objectives may attend for a year or two as "general" majors, taking courses that meet general requirements for graduation and that provide general education as a foundation for more specific work selected not later than the end of the sophomore year.

use of the catalog . . .

1. Students should study with care those sections on REGISTRATION AND GENERAL REGULATIONS and on GRADUATION REQUIREMENTS. This information should be reviewed before registration periods.
2. When checking on particular courses, be sure to review COURSE DESCRIPTIONS (see Index).
3. Detailed fall quarter class schedules carry course forecasts for winter and spring quarters, for which detail is usually available by the middle of each preceding quarter.
4. If you have selected a major, study carefully the specific additional requirements for graduation listed under your chosen field. You are responsible for planning your program.
5. When in doubt as to meanings or interpretation of listed information, consult your adviser or department chairman.

CATALOG USERS NOTE . . . The fee for taking the ACT examination on campus will be \$8 (page 11 under TESTING).

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UNIVERSITY OF MONTANA BULLETIN

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calendar 1968-1969 . . .

UNIVERSITY OF MONTANA

See Law School section of catalog for Law School Calendar
(Semester System)

1968

AUTUMN QUARTER

September 23-28, Monday through Saturday.....Orientation Week and Registration
September 26-27, Thursday and Friday.....Registration
September 30, Monday.....Instruction begins
November 11, Monday.....Veterans' Day, a holiday
November 28, Thursday.....Thanksgiving Day, a holiday
December 16-20, Monday through Friday.....Examinations
December 20, 5:20 p.m.....Autumn Quarter ends
Christmas recess begins

1969

WINTER QUARTER

January 6, Monday.....Registration
January 7, Tuesday.....Instruction begins
February 17, Monday.....Charter Day
March 17-21, Monday through Friday.....Examinations
March 21, 5:20 p.m.....Winter Quarter ends
Spring recess begins

SPRING QUARTER

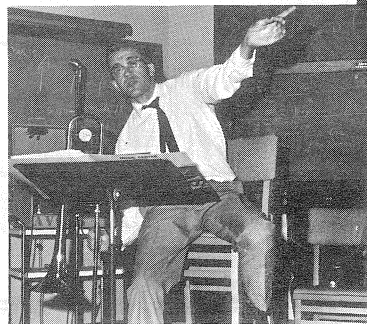
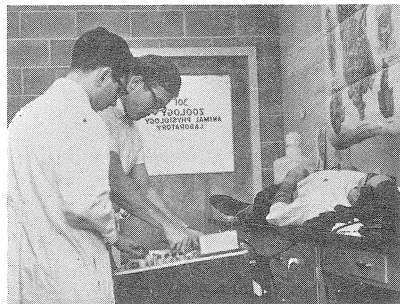
March 31, Monday.....Registration
April 1, Tuesday.....Instruction begins
May 30, Friday.....Memorial Day, a holiday
June 9-13, Monday through Friday.....Examinations
June 13, 5:20 p.m.....Spring Quarter ends
June 15, Sunday.....Commencement

SUMMER QUARTER

June 23, Monday (9 weeks and First Half-Session) Instruction begins
July 4, Friday.....Independence Day, a holiday
July 23, Wednesday.....First Half-Session ends
July 24, Thursday.....Second Half-Session begins
August 22, Friday, 5:20 p.m.....Summer Quarter ends

AUTUMN QUARTER

September 22-27, Monday through Saturday.....Orientation
September 25-26, Thursday and Friday.....Registration
September 29, Monday.....Instruction begins
November 11, Tuesday.....Veterans' Day, a holiday
November 27, Thursday.....Thanksgiving Day, a holiday
December 15-19, Monday through Friday.....Examinations
December 19, 5:20 p.m.....Autumn Quarter ends
Christmas recess begins



official directory, 1967-1968 . . .

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THEODORE JACOBS, Missoula
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- FREER, COBURN, Ph.D., University of Washington; Assistant Professor of English
- FRENCH, CECIL L., Ph.D., Washington University; Professor of Sociology
- FRIEDLEIN, CHARLES M. (Major), B.S., University of Dubuque; Associate Professor of Military Science (Faculty Affiliate)
- FRISSELL, SIDNEY J., Jr., Ph.D., University of Minnesota; Assistant Professor Forestry
- FRITZ, HARRY W., M.A., University of Montana; Instructor in History
- FUQUAY, DONALD M., M.S., University of Washington; Research Associate in Forestry (Faculty Affiliate)
- GANZ, EARL S., M.F.A., University of Iowa; Assistant Professor of English
- GARNER, BEA M., (Mrs.) M.A., Michigan State University; Instructor in Anthropology
- GERLACH, FREDERICK L., M.F., University of Montana; Assistant Professor of Forestry
- GEYER, EDMUND P., M.S., Western Washington State College; Instructor in Mathematics (part-time)
- GIBSON, WILLIAM K., M.F., University of Montana; Assistant Professor of Forestry
- GILBERT, VEDDER M., Ph.D., Cornell University; Professor of English
- GLEASON, HELEN, M.A., Columbia University; Professor Emeritus of Home Economics
- GOLD, RAYMOND L., Ph.D., University of Chicago; Professor of Sociology and Research Director of Institute for Social Science Research
- GORDON, CLARENCE C., Ph.D., Washington State University; Associate Professor of Botany
- GORMAN, ROBERT E., Ed.D., Indiana University; Director of the Counseling Center; Professor of Education
- GOTTFRIED, HERBERT W., M.A., University of Montana; Instructor in English
- GRAY, WILLIAM A., M.A., University of Edinburgh; Visiting Lecturer in Foreign Languages
- GROOM, IRENE D., M.A. (L.S.), George Peabody College for Teachers; Assistant Professor of Education (on leave 1967-68)
- HABECK, JAMES R., Ph.D., University of Wisconsin; Associate Professor of Botany
- HAIGES, MANFRED, M.F., Colorado State University; Instructor in Forestry
- HALL, CHARLES B., M.A., State University of New York; Instructor in English
- HALL, JAMES F., Ed.D., University of Montana; Coordinator of Extension and Continuing Education; Assistant Professor of Education
- HALVORSON, CURTIS H., B.S., University of Wisconsin; Research Associate in Forestry (Faculty Affiliate)
- HAMMEN, OSCAR J., Ph.D., University of Wisconsin; Professor of History
- HAMPTON, H. DUANE, Ph.D., University of Colorado; Assistant Professor of History

- HANSEN, BERT, M.A., University of Washington; Professor Emeritus of Speech
- HANSEN, DANIEL L., M.S., Michigan State University; Instructor in Mathematics (part-time)
- HANSON, KURT A., M.A., University of Montana; Instructor in Foreign Languages
- HARDY, CHARLES E., M.F., University of Michigan; Research Associate in Forestry (Faculty Affiliate)
- HARDY, MABELLE G. (Mrs.), M.A., University of Montana; Instructor in Social Welfare (part-time)
- HARRIS, JERRY L., M.A., University of Montana; Instructor in English
- HARRIS, JOHN T., Ph.D., University of Michigan; Assistant Professor of Wildlife Management
- HARVEY, LeROY H., Ph.D., University of Michigan; Professor of Botany and Curator of the Herbarium
- HARVEY, MARIA (Mrs.), M.A., University of Michigan; Lecturer in Foreign Languages
- HAUPT, JEROME L. (Captain), B.S., Gonzaga University; Assistant Professor of Military Science (Faculty Affiliate)
- HAYDEN, RICHARD J., Ph.D., University of Chicago; Professor of Physics
- HEBERT, EUGENE L., M.A., University of Oregon; Instructor in Foreign Languages
- HELBING, ALBERT T., Ph.D., Johns Hopkins University; Professor of Business Administration (Management)
- HELIKER, GEORGE B., Ph.D., University of Michigan; Professor of Economics
- HEMINGWAY, PETER, Ph.D., Michigan State University; Associate Professor of Psychology
- HENDERSON, DOROTHY I., M.S., University of Tennessee; Associate Professor of Home Economics
- HENDERSON, MASON E., Ph.D., Oregon State University; Assistant Professor of Mathematics
- HENDRICKSON, JOHN H., M.M., University of Oregon; Campus Service Coordinator of Instructional Materials Service (Assistant Professor)
- HENNINGSSEN, FREDERICK A., M.A., University of Montana; C.P.A., Montana; Associate Professor of Business Administration (Accounting)
- HENRY, STEPHEN S., M.A., University of Montana; Operations Manager of Computer Center; Instructor in Computer Science
- HERBIG, HAROLD H., M.Mus., Eastman School of Music; Instructor in Music (part-time)
- HERTLER, CHARLES F., M.A., Columbia University; Professor of Health and Physical Education
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- HEWITT, GLORIA C. (Mrs.), Ph.D., University of Washington; Associate Professor of Mathematics
- HILL, FRANCES A., Ph.D., Ohio State University; Assistant Professor of Psychology
- HINDS, JIM E. (Captain), B.A., University of Montana; Assistant Professor of Military Science (Faculty Affiliate)
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- HOFFMAN, RUDOLPH O., M.A., University of Wisconsin; Professor Emeritus of French
- HOFFMANN, ROBERT S., Ph.D., University of California; Professor of Zoology and Director of Environmental Biology
- HOGAN, HENRY W., M.D., Jefferson Medical College; Lecturer in Psychology (Faculty Affiliate)
- HONKALA, FRED S., Ph.D., University of Michigan; Dean of the Graduate School; Director of Research for the University of Montana Foundation; Professor of Geology
- HOOD, CHARLES E., M.A., University of Montana; Director of Placement; Assistant Professor of Education
- HOOK, WALTER, M.A., University of New Mexico; Professor of Art
- HOROWITZ, SAMUEL, M.H.L., Jewish Institute of Religion; Lecturer in Religion (Spring Quarter) (Faculty Affiliate)
- HOWARD, JOSEPH W., Ph.D., University of Illinois; Professor Emeritus of Chemistry
- HUCUL, WALTER C., Ph.D., University of California; Visiting Lecturer in History
- HUFF, THOMAS P., Ph.D., Rice University; Assistant Professor of Philosophy
- HUGO, RICHARD, M.A., University of Washington; Assistant Professor of English (on leave 1967-68)
- HUMMEL, J. GEORGE, M.A., Columbia University; Professor of Music
- HUNT, JOHN J., Ed.D., Colorado State College; Associate Professor of Education
- HUNT, LAWRENCE J., D.B.A., University of Oregon; Assistant Professor of Business Administration (Management) (on leave 1967-69)
- HUSO, MICHELA M. (Mrs.), Instructor in Foreign Languages
- HUT, LUCIEN (LUITJEN) M.M., Royal Conservatorium, Rotterdam; Assistant Professor of Music
- HYNDMAN, DONALD W., Ph.D., University of California; Assistant Professor of Geology
- JACOBSON, N. NORMAN, M.A.T., Washington State University; Assistant Professor of Education
- JAKOBSON, MARK J., Ph.D., University of California; Professor of Physics
- JAMES, RICHARD H., M.A., Northwestern University; Associate Professor of Drama
- JARKA, HORST, Ph.D., University of Vienna; Associate Professor of Foreign Languages
- JAY, ROBERT H., Ed.D., University of Oregon; Associate Professor of Education
- JELLISON, WILLIAM L., Ph.D., University of Minnesota; Lecturer in Zoology (Faculty Affiliate)
- JENNI, DONALD A., Ph.D., University of Florida; Associate Professor of Zoology
- JENNINGS, JOSEPH W., JR., Ph.D., Michigan State University; Assistant Professor of Psychology
- JEPPesen, C. RULON, Ph.D., University of California, Chairman and Professor of Physics
- JEPPesen, RANDOLPH H., M.S., University of Illinois; Assistant Professor of Physics
- JOHNSON, MAXINE C. (Mrs.), M.A., University of Montana; Assistant Director of the Bureau of Business and Economic Research and Assistant Professor of Business Administration (Management)
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- JOHNSON, ROBERT H., JR., Ed.D., Colorado State College; Professor of Education and Director of Educational Research and Service
- JOHNSON, THOMAS G., Ph.D., University of Chicago; Chairman and Professor of Management (Business Administration)
- JOHNSTON, DONALD O., Ph.D., Eastman School of Music, Associate Professor of Music
- JONES, ROBERT G., M.M., University of Wichita; Visiting Assistant Professor of Music
- JUDAY, RICHARD E., Ph.D., University of Wisconsin; Professor of Chemistry
- KARLIN, JULES A., Ph.D., University of Minnesota; Professor of History
- KEMPNER, JACK J., Ph.D., Ohio State University; C.P.A., Montana; Chairman and Professor of Accounting (Business Administration)
- KERSTEN, FRED, Ph.D., New School for Social Research; Assistant Professor of Philosophy
- KERSTEN, RAQUEL (Mrs.), Ph.D., New York University; Lecturer in Foreign Languages
- KING, WALTER N., Ph.D., Yale University; Professor of English
- KIRKPATRICK, THOMAS O., Ph.D., Ohio State University; Associate Professor of Business Administration (Management)
- KNAB, BERNARD M., M.A., Washington State University; Instructor in English
- KOEPPEN, DONALD B., Ph.D., University of Wisconsin; Chairman and Professor of Business Education and Office Administration (Business Administration)
- KONIZESKI, RICHARD L., Ph.D., University of Chicago; Professor of Forestry
- KOTOK, EDWARD S., M.S.F., University of Michigan; Research Associate in Forestry (Faculty Affiliate)
- KRAMER, JOSEPH, Ph.D., University of Nebraska; Professor Emeritus of Botany
- KRIER, JOHN P., Ph.D., Yale University; Professor of Forestry
- KUHN, C. BARCLAY, M.A., Northwestern University; Instructor in Political Science
- LACKEY, LAWRENCE, B.S., University of Michigan; Professor of Forestry (Faculty Affiliate)
- LACKMAN, DAVID B., Ph.D., University of Pennsylvania; Lecturer in Immunology, Department of Microbiology (Faculty Affiliate)
- LACKSCHWITZ, GERTRUD (Mrs.), Ph.D., Goettingen University (Germany), Associate Professor of Foreign Languages
- LAHEY, EDWARD T., M.A., University of Montana; Instructor in English
- LANGE, ROBERT W., M.F., Colorado State University; Assistant Professor of Forestry
- LAPIKEN, PETER P., Ph.D., University of California; Professor of Foreign Languages
- LARSON, CARL L., M.D., University of Minnesota; Director of the Stella Duncan Memorial Institute; Professor of Microbiology
- LAWRY, JOHN F., Ph.D., Harvard University; Associate Professor of Philosophy
- LAWTHER, JOHN D., M.A., Columbia University; Visiting Professor of Health and Physical Education (Winter and Spring Quarters)
- LEA, MURIEL JANE (Mrs.), M.Mus., College Conservatory of Music of Cincinnati; Assistant Professor of Music

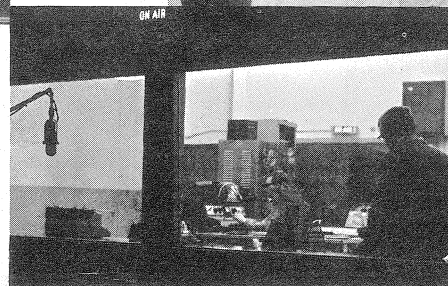
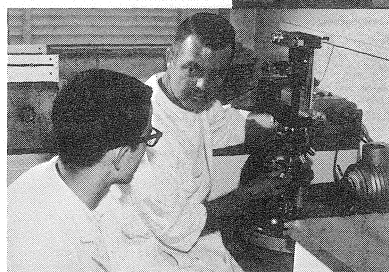
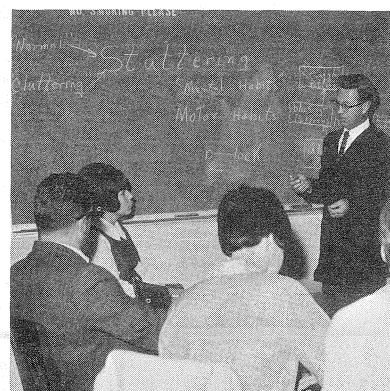
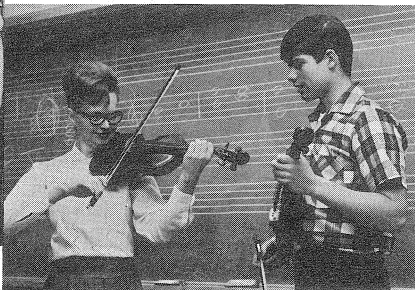
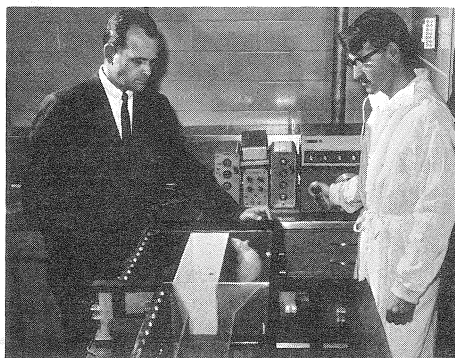
6—OFFICIAL DIRECTORY

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- LEWIS, HARLEY W., M.S., University of Montana; Track and Cross Country Coach and Instructor in Health and Physical Education
- LEWIS VANETTA (Mrs.), M.Ed., University of Montana; Associate Professor of Home Economics
- LINDSAY, ROBERT O., Ph.D., University of Oregon; Associate Professor of History
- LINE, ROBERT C., M.A., Harvard University; Professor Emeritus of Business Administration
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- LOENDORF, LAWRENCE L., M.A., University of Montana; Instructor in Anthropology
- LOFTSGAARDEN, DON O., Ph.D., Montana State University; Assistant Professor of Mathematics
- LOHN, SHERMAN V., LL.M., Harvard University; Lecturer in Law (part-time)
- LOMMASSON, EMMA B. (Mrs.), M.A., University of Montana; Assistant Registrar (Instructor)
- LORENZ, MAVIS M., M.S., University of Washington; Associate Professor of Health and Physical Education
- LORING, EMILIE (Mrs.), M.A., University of Montana; Research Associate, Bureau of Government (part-time)
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- LOWE, JAMES H., Jr., Ph.D., Yale University; Assistant Professor of Forestry and Zoology
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- LUNDQUIST, RUSSELL M., M.S., Mankato State College; Assistant Professor of Business Education and Office Administration (Business Administration)
- LYON, L. JACK, Ph.D., University of Michigan; Research Associate in Forestry (Faculty Affiliate)
- MAGAR, MAGAR E., Ph.D., University of California; Assistant Professor of Chemistry
- MALLORY, R. PATRICK, M.L.S., University of Illinois; Order Librarian (Instructor)
- MALOUF, CARLING I., Ph.D., Columbia University; Professor of Anthropology
- MANIS, MERLE E., Ph.D., University of Oregon; Assistant Professor of Mathematics
- MANLOVE, SPENCER, M.S., San Jose State College; Associate Professor of Computer Science
- MANNING, WILLIAM M., M.Mus., Drake University; Assistant Professor of Music (on leave 1967-68)
- MANSFIELD, MICHAEL J., M.A., University of Montana; Professor of History (on leave)
- MARBUT, REED, D.V.M., Colorado State University; Research Associate in Forestry (Faculty Affiliate)
- MARSILLO, LINO A., LL.B., University of Montana; Lecturer in Business Administration (Management) (part-time)
- MARTELL, EARL W., B.A., University of Montana; Director of Student Activity Facilities; Business Manager of Athletics (Instructor)
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- MARTINSON, ALVHILD J., M.Ed., University of Montana; Associate Professor of Business Education and Office Administration (Business Administration)
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- MASON, SUDIE D. (Mrs.), M.S., University of Tennessee; Instructor in Home Economics (part-time)
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- MCDUFFIE, KEITH A., M.A., Middlebury College; Lecturer in Foreign Languages
- MCGIFFERT, ROBERT C., M.A., Ohio State University; Associate Professor of Journalism
- MCGLYNN, FRED F., M.A., Northwestern University; Visiting Instructor in Philosophy
- McHUGH, HELGA H. (Mrs.), M.Ed., University of Montana; Instructor in Home Economics (part-time)
- McLAVERY, BERNARD J., M.D., Jefferson Medical College; Lecturer in Pathology and Medical Technology, Department of Microbiology (Faculty Affiliate)
- MEANS, HARWOOD F. (Lt. Col.), M.A., George Washington University; Chairman and Professor of Aerospace Studies (Faculty Affiliate)
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- MERRIAM, HAROLD G., Ph.D., Columbia University; Professor Emeritus of English
- MERRILL, A. S., Ph.D., University of Chicago; Vice President Emeritus; Dean Emeritus of the Faculty; Professor Emeritus of Mathematics
- MEYER, RALEIGH R. (Major), B.A., University of Oregon; Associate Professor of Military Science (Faculty Affiliate)
- MICHEL, MAURICE M., LL.B., Loyola University; Law Librarian; Assistant Professor of Law
- MIDGETT, ADELAINE S. (Mrs.), B.A., University of Montana; Assistant Catalog Librarian (Assistant Professor)
- MILLER, CHARLES N., Ph.D., University of Michigan; Assistant Professor of Botany
- MILLER, DONALD C., M.A., University of South Dakota; Assistant Professor of Journalism
- MILLER, J. EARL, Ph.D., University of Illinois; Professor Emeritus of History
- MILLER, KURT R., D.M.A., University of Southern California; Associate Professor of Music
- MILLIS, GEORGE H., Ed.D., University of Illinois; Professor of Education
- MILLS, DOUGLAS E., M.A., University of California; Director of Technical Services, Library (Associate Professor)
- MILNER, KELSEY C., Ph.D., Tulane University; Lecturer in Medical Microbiology (Faculty Affiliate)
- MILODRAGOVICH, FANNIE E. (Mrs.), M.S., Washington State University; Associate Professor of Home Economics (part-time)
- MITCHELL, GEORGE L., LL.B., University of Montana; Assistant Professor of Business Administration (Management)
- MONK, LOIS H., Ph.D., Occidental College; Assistant Professor of English
- MOOAR, MARIE (Mrs.), M.A., University of Montana; Research Associate in Botany (Faculty Affiliate)
- MOORE, JOHN E., M.A., University of Michigan; Professor of English
- MOORE, MARY Y. (Mrs.), M.S., Drexel Institute of Technology; Assistant Catalog Librarian (Instructor)
- MORRIS, MELVIN S., M.S., Colorado State University; Professor of Forestry
- MUNOZ, JOHN J., Ph.D., University of Wisconsin; Lecturer in Microbiology (Faculty Affiliate)
- MUNRO, JAMES J. R., Ed.D., University of Washington; Associate Professor of Education
- MUSSULMAN, JOSEPH A., Ph.D., Syracuse University; Associate Professor of Music
- MUTCH, ROBERT W., M.S., University of Montana; Research Associate in Forestry (Faculty Affiliate)
- MYERS, WILLIAM M., Ph.D., Ohio State University; Chairman and Professor of Mathematics
- NAKAMURA, MITSURU J., Ph.D., Boston University; Chairman and Professor of Microbiology
- NELSON, RITA (Mrs.), B.A., University of Montana; Assistant Acquisitions Librarian and Serials Librarian (Assistant Professor)
- NIMLOS, THOMAS J., Ph.D., University of Wisconsin; Associate Professor of Forestry
- NOBLE, JOHN H., Jr., B.S., University of Montana, CPA Montana; Instructor in Accounting (Business Administration)
- NONNENMACHER, PATRICIA J. (Mrs.), M.A., Northwestern University; Instructor in Foreign Languages (part-time)
- NORD, RONALD V., B.S., University of Wisconsin; Assistant Football Coach
- OAKLAND, LLOYD, M.Mus., Northwestern University; Professor of Music
- OLSON, JACK R., Ph.D., Ohio State University; Visiting Assistant Professor of Speech Pathology and Audiology
- OLSON, VALERIE S. (Mrs.), M.A., University of Montana; Instructor in Speech Pathology and Audiology
- ORMSBEE, R. A., Ph.D., Brown University; Lecturer in Biochemistry, Department of Microbiology (Faculty Affiliate)
- ORTISI, DOMENICO, Ph.D., University of California; Associate Professor of Foreign Languages
- OSTERHELD, R. K., Ph.D., University of Illinois; Professor of Chemistry
- PACE, R. WAYNE, Ph.D., Purdue University; Chairman and Associate Professor of Speech Communication
- PANTZER, ROBERT T., LL.B., University of Montana; President; Professor of Business Administration

- PAPOUSEK, ELIZABETH (Mrs.), Ph.D., University of California at Los Angeles; Assistant Professor of Mathematics
- PARKER, CHARLES D., Ph.D., State University of Iowa; Director of the Speech and Hearing Clinic; Chairman and Professor of Speech Pathology and Audiology
- PAYNE, THOMAS, Ph.D., University of Chicago; Professor of Political Science
- PEDERSON, CLIFFORD W. (Captain), B.S., University of Montana; Assistant Professor of Aerospace Studies (Faculty Affiliate)
- PENGELLY, W. LESLIE, Ph.D., Utah State University; Associate Professor of Forestry
- PERRY, LAURENCE B., M.Mus., Syracuse University; Chairman and Associate Professor of Music
- PETERSON, DONALD W., M.S., Springfield College; Instructor in Health and Physical Education
- PETERSON, JAMES A., Ph.D., University of Minnesota; Professor of Geology
- PETERSON, JOHN A., M.A., University of Montana; Associate Professor of Mathematics; Assistant Director of the Computer Center
- PETERSON, ROBERT L., B.A., University of Montana; Visiting Lecturer in Economics
- PETERSON, ROBERT LEWIS, Ph.D., University of Texas; Chairman of History Department; Hill Professor of Business History
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- PFISTER, ROBERT D., M.S., Oregon State University; Research Associate in Forestry (Faculty Affiliate)
- PHILIP, CORNELIUS B., Ph.D., University of Minnesota; Lecturer in Zoology (Faculty Affiliate)
- PHILLIPS, MICHAEL J., M.A., Washington State University; Instructor in Foreign Languages
- PIERCE, WILLIAM R., Ph.D., University of Washington; Professor of Forestry
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- POLSIN, JAMES H., M.A., University of Kansas; Instructor in Speech Communication
- POPE, ALLEN L., Ed.D., University of Montana; Assistant Professor of Education (Continuing Education)
- PORTER, LEONARD E., Ph.D., University of Wisconsin; Assistant Professor of Physics
- POWELL, WARD H., Ph.D., University of Colorado; Professor of Foreign Languages
- PREECE, SHERMAN J., JR., Ph.D., Washington State University; Chairman and Associate Professor of Botany
- RAMSKILL, BERNICE B. (Mrs.), Associate Professor Emeritus of Music
- REINHARDT, HOWARD E., Ph.D., University of Michigan; Professor of Mathematics
- REINHOLTZ, RICHARD B., M.Ed., University of Minnesota; Chairman and Associate Professor of Art
- REYNOLDS, FLORENCE, A.M.D., Eastman School of Music; Professor of Music
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- RIDGES, JANICE R., M.A., University of Illinois; Instructor in Foreign Languages
- RIESE, HARLAN C., Ed.D., University of Montana; Associate Professor of Education
- ROBERTS, DEXTER M., Ph.D., Stanford University; Assistant Professor of English
- ROCHELEAU, LOUIS A., B.A., University of Montana; Assistant Basketball Coach
- ROTHERMEL, RICHARD C., B.S., University of Washington; Research Associate in Forestry (Faculty Affiliate)
- RUBACH, JON A., Ph.D., University of Michigan; Lecturer in Microbiology (Faculty Affiliate)
- RUMMEL, J. FRANCIS, Ph.D., State University of Iowa; Dean and Professor of Education
- RUSOFF, LESTER R., LL.M., University of Michigan; Professor of Law
- SAPPENFIELD, BERT R., Ph.D., New York University; Professor of Psychology
- SCHMAUTZ, JACK L., M.S.F., University of Montana; Research Associate in Forestry (Faculty Affiliate)
- SCHOTT, EDDIE W., Ph.D., University of Colorado; Visiting Diplomat-in-Residence, Political Science (Faculty Affiliate)
- SCHUSTER, CYNTHIA A. (Mrs.), Ph.D., University of California at Los Angeles; Professor of Philosophy
- SCHWANK, WALTER C., Ph.D., State University of Iowa; Coordinator of Summer Session and Chairman and Professor of Health and Physical Education
- SELJAK, HARLAND, M.E., University of Montana; Assistant Professor of Education
- SHAFIZADEH, FRED, Ph.D., University of Birmingham; Professor of Chemistry and Forestry and Director of the University of Montana Wood Chemistry Laboratory
- SHALLENBERGER, G. D., Ph.D., University of Chicago; Professor Emeritus of Physics
- SHANNON, RICHARD E., Ph.D., Ohio State University; Professor of Economics
- SHARKEY, BRIAN J., Ph.D., University of Maryland; Assistant Professor of Health and Physical Education (on leave 1967-68)
- SHELLEN, WESLEY N., M.A., Arizona State University; Instructor in Speech Communication
- SHERIDAN, RICHARD P., Ph.D., University of Oregon; Assistant Professor of Botany
- SHOEMAKER, THEODORE H., Ph.D., University of Wisconsin; Acting Chairman and Professor of Foreign Languages
- SILVERMAN, ARNOLD J., Ph.D., Columbia University; Associate Professor of Geology
- SINGER, GEORGE, Ph.D., Oregon State University; Assistant Professor of Zoology
- SLETTEN, VERNON O., Ed.D., University of Oregon; Professor of Education
- SMITH, DAVID J., Ph.D., University of Washington; Assistant Professor of English (on leave 1967-68)
- SMITH, LEO, M.A., University of Washington; Registrar; Professor of Education
- SMITH, PETER B., Ph.D., University of Washington; Assistant Professor of Speech Pathology and Audiology
- SOLBERG, RICHARD A., Ph.D., University of California at Los Angeles; Associate Dean, College of Arts and Sciences; Director of the Biological Station; Associate Professor of Botany
- SORENSEN, THORA, Ph.D., Mexico National University; Professor Emeritus of Foreign Languages
- SPEER, LUCILE E., M.A., University of Chicago; Documents Librarian (Professor) (on leave Winter and Spring Quarters)
- STAAEL, NORA, M.A., Columbia University; Assistant Professor of Health and Physical Education (part time)
- STEBLER, ADOLPH M., Ph.D., University of Michigan; Visiting Professor and Acting Director of Montana Cooperative Wildlife Research Unit (Faculty Affiliate)
- STEELE, ROBERT W., M.F., University of Michigan; Associate Professor of Forestry
- STETSON, FREDERICK A., M.S., Purdue University; Head Swimming Coach and Manager of the University Pool; Assistant Professor of Health and Physical Education
- STEVENS, ROBERT R., Ph.D., University of Arizona; Assistant Professor of Mathematics
- STEWART, JOHN M., Ph.D., University of Illinois; Chairman and Professor of Chemistry
- STOCKING, JOHN R., M.A., University of British Columbia; Assistant Professor of Art
- STOENNER, HERBERT G., D.V.M., Iowa State University; Lecturer in Veterinary Medicine, Department of Microbiology (Faculty Affiliate)
- STONE, ALBERT W., LL.B., Duke University; Professor of Law
- STONER, WILLIAM G., Ed.D., Stanford University; Associate Professor of Education
- STOODLEY, AGNES L., Ed.D., Stanford University; Professor of Health and Physical Education
- SUCHY, JOHN F., Ph.D., University of Colorado; Professor Emeritus of Pharmacy
- SULLIVAN, ROBERT E., LL.B., University of Notre Dame; Dean and Professor of Law
- SWANSON, MARGARET A. (Mrs.), M.Ed., University of Washington; Associate Professor of Business Administration (Business Education and Office Administration)
- SWANSON, MAX R., B.S., University of Nebraska; C.P.A., Montana and Nebraska; Lecturer in Business Administration (Accounting) (part-time)
- SWARTHOUT, JACK, B.A., University of Montana; Athletic Director and Head Football Coach
- SWARTZ, BILLIE A. (Mrs.), B.S., Colorado State University; Instructor in Home Economics (half-time)
- SWEARINGEN, T. G., B.A., University of Montana; Director Emeritus of Planning and Construction
- TABER, RICHARD D., Ph.D., University of California; Professor of Forestry and Associate Director of the Forest and Conservation Experiment Station; Director of Center for Natural Resources
- TASCHER, HAROLD, Ph.D., University of Illinois; Professor of Social Welfare
- TATSUYAMA, TOSHIMI, Th.D., Boston University; Associate Professor of Religion (Faculty Affiliate)
- TAYLOR, DEE C., Ph.D., University of Michigan; Professor of Anthropology

8—OFFICIAL DIRECTORY

- TAYLOR, JOHN J., Ph.D., Ohio State University; Associate Professor of Microbiology
- TAYLOR, MAURICE C., M.A., Washington State University; Visiting Professor of Business Administration (Management); Research Associate, Bureau of Business and Economic Research
- TAYLOR, NORMAN E., Ph.D., University of Minnesota; Administrative Vice President; Professor of Business Administration
- TEMPLETON, JAMES R., Ph.D., University of Oregon; Associate Professor of Zoology
- THANE, JEREMY G., LL.B., University of Montana; Lecturer in Law (part-time)
- THOMAS, BEVERLY J., M.F.A., Carnegie Institute of Technology; Instructor in Drama
- THOMAS, FORREST D., Ph.D., Pennsylvania State University; Associate Professor of Chemistry
- THOMPSON, EARLE C., M.L.S., Emory University; Dean of Library Services (Professor)
- TIBBS, JOHN, M.S., University of Southern California; Instructor in Zoology
- TODD, REGINA (Mrs.), M.A., Monterey Institute of Foreign Studies; Instructor in Foreign Languages
- TOLLIVER, ROSALIND M. (Mrs.), B.A., University of Washington; Instructor in Foreign Languages
- TONSFELDT, WARD, M.A., Occidental College; Instructor in English
- TOELLE, J. HOWARD, LL.M., Harvard University; Professor Emeritus of Law
- TOOLE, K. ROSS, Ph.D., University of California at Los Angeles; Professor of History
- TRASK, MARVIN, M.A., Louisiana State University; Visiting Instructor in Mathematics
- TRICKEY, GEORGE, M.A., University of Montana; Instructor in Mathematics
- TURNER, ROBERT T., Ph.D., University of California at Los Angeles; Professor of History
- USHIJIMA, RICHARD N., Ph.D., University of Utah; Assistant Professor of Microbiology
- VAN DE WETERING, JOHN E., Ph.D., University of Washington; Associate Professor of History
- VAN DE WETERING, MAXINE (Mrs.), B.A., University of California at Los Angeles; Lecturer in the History of Science (part-time)
- VAN HORNE, ROBERT L., Ph.D., State University of Iowa; Dean and Professor of Pharmacy
- VAN MEYER, WAYNE P., Ph.D., University of Washington; Associate Professor of Chemistry
- VICK, ODIN C., Ph.D., Pennsylvania State University; Assistant Professor of Psychology
- VOORHEES, TWILA B. (Mrs.), M.A., University of Montana; Instructor in Sociology (part-time)
- WAGNER, PAUL, M.D., University of Minnesota; Staff Physician, Health Service
- WAILES, JOHN L., Ph.D., University of Colorado; Professor of Pharmacy
- WALDRON, ELLIS L., Ph.D., University of Wisconsin; Professor of Political Science and Director of the Bureau of Government
- WALLACE, ROBERT F., Ph.D., University of Minnesota; Chairman and Professor of Economics
- WALTERS, H. A., Ph.D., Pennsylvania State University; Assistant Professor of Psychology (part-time)
- WAMBACH, ROBERT F., Ph.D., University of Minnesota; Associate Professor of Forestry
- WANG, JOHN B., Ph.D., University of Maryland; Assistant Professor of Foreign Languages
- WARWICK PAUL S., M.A., Claremont Graduate School; Instructor in English
- WATKINS, JOHN G., Ph.D., Columbia University; Director of Clinical Training and Professor of Psychology
- WATSON, FRANK J., M.A., Northwestern University; Associate Professor of Education
- WEHREBERG, JOHN P., Ph.D., University of Illinois; Professor of Geology
- WEIDMAN, ROBERT M., Ph.D., University of California; Professor of Geology
- WEIGEL, EUGENE, B.Mus., Yale University; Professor of Music
- WEISEL, GEORGE F., Ph.D., University of California at Los Angeles; Professor of Zoology
- WENDT, RUDOLPH, M.Mus., Eastman School of Music, Professor of Music
- WHITE, ELAINE, M.A., University of Montana; Instructor and Executive Secretary of Education
- WHITE, M. CATHERINE, M.A., University of Montana; Assistant Librarian and Reference Librarian Emeritus (Professor Emeritus)
- WHITE, ROY C., Ed.D., University of Montana; Assistant Professor of Education
- WHITEHOUSE, JAMES M., Ph.D., University of Colorado; Associate Professor of Psychology
- WICKS, JOHN H., Ph.D., University of Illinois; Associate Professor of Economics
- WILDEY, RONALD, B.A., Washington State University; Visiting Lecturer in Music (Part-time)
- WILLIAMS, ROSS, M.F., Yale University; Dean and Professor Emeritus of Forestry; Director Emeritus of the Forest and Conservation Experiment Station
- WILLMERING, WILLIAM J., M.L.S., University of Illinois; Assistant Reference Librarian (Instructor)
- WILSON, BRENDA F. (Mrs.), M.A., University of Southern California; Professor Emeritus of Business Administration (Business Education and Office Administration)
- WILSON, VINCENT, M.A., New York University; Professor of Health and Physical Education
- WINSTON, DONALD, II, Ph.D., University of Texas; Associate Professor of Geology
- WOODBURY, GEORGE W., Ph.D., University of Minnesota; Assistant Professor of Chemistry
- WRIGHT, BENJAMIN W., M.A., University of Montana; Instructor in Sociology
- WRIGHT, PHILIP L., Ph.D., University of Wisconsin; Chairman and Professor of Zoology
- YALE, I. KEITH, Ph.D., University of California; Assistant Professor of Mathematics
- YATES, LELAND, M., Ph.D., Washington State University; Associate Professor of Chemistry (in charge of the storeroom)
- ZIMMERMAN, ROBERT R., Ph.D., University of Wisconsin; Professor of Psychology



—university of montana / missoula

about the university . . .

FOUNDING AND NAME . . . The University of Montana at Missoula 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 with additional accrediting is approved by the 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 eleven-member State Board of Education, ex-officio Regents of the Montana University System. There is also a local three-member Executive Board for each institution. The administration of each institution is vested in a president.

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

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

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

The University's program of undergraduate education makes available to the student a fund of knowledge pertaining to the world in which he lives and to the heritage of free men and institutions. It seeks to liberate his intellectual capacities for continued learning and to deepen his awareness of ethical and aesthetic values. It fosters these goals through (1) teaching that stimulates the student and inspires him to continue, on his own, the search for knowledge; (2) a

campus environment that sustains the efforts of teachers and students to achieve the basic objectives for which the University exists; and (3) a curriculum that: (a) provides reasonable depth in the several liberal arts disciplines—the biological, physical and social sciences, the humanities and the fine arts, (b) requires demonstrated literacy in use of the English language and encourages competence in foreign languages, (c) provides opportunity for development of professional and technical competence in some field of endeavor, (d) reveals man's great insights and discoveries of the past and stimulates the individual to seek new insights and discoveries, (e) 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.

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 Fort Missoula where the University owns a parcel of 295 acres. Two major UM facilities are located outside Missoula: 20,850 acres in Lubrecht Experimental Forest, 35 miles northeast of Missoula, and 167 acres on Flathead Lake including the Biological Station, 90 miles north of Missoula at Yellow Bay.

LIBRARIES . . . Campus libraries have over 450,000 volumes in their collections, including extensive holdings of periodicals, maps, microtext, government publications and a special Northwest History collection. The library is a regional depository for United States Government documents and for the Army Map Service.

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

Facilities include an administration-recreation building, a four-room laboratory, three one-room laboratories, a kitchen and dining hall, three bath houses, thirty-five one-room and eleven two-room cabins, and various maintenance buildings. Construction of a \$200,000 research laboratory, named in honor of Morton J. Elrod, began during the summer of 1966. Supported by an NSF grant, the laboratory was dedicated in August, 1967.

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*; the *Montana Trade Association Directory*, issued annually; and various monographs. Contributors include members of the bureau staff, the faculty, and on occasion, students.

THE FOREST AND CONSERVATION EXPERIMENT STATION of the School of Forestry operates under Chapter 141, Laws of Montana of 1937. 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 pasturage 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 windbreaks, shelter belts and woodlots on the farms of the State . . . to study logging, lumbering and milling operations and other operations dealing with the products of forest soils with special reference to their improvement . . ."

"To cooperate with the other departments of the Montana University System, the state forester and the state board of 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 . . . to accept for and in behalf of the State of Montana, such gifts of land or other donations as may be made."

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

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

THE BUREAU OF GOVERNMENT RESEARCH, an adjunct of the Department of Political Science, furnishes an opportunity for independent faculty research, provides a training ground for undergraduate and graduate students and serves public officials and civic groups through organizing institutes and preparing publications. It is an information clearinghouse with collections of state legislative materials and publications of governmental agencies and similar bureaus. Publications include a bimonthly series entitled the *Montana Public Affairs Report* and occasional series of pamphlets and monographs prepared by the bureau staff, the 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 may be taken with the area of concentration either in wildlife management or in wildlife biology. It ordinarily will require two years work beyond the bachelor's degree to fulfill the requirements for a degree of Master of Science in Wildlife Biology. Concentration in

the area of wildlife management ordinarily will lead to the degree of Master of Science in Wildlife Management.

The Cooperative Wildlife Research Unit allocates funds for four or more graduate research fellowships for students working toward the degree of Master of Science in Wildlife Biology, or Master of Science in Forestry with the area of concentration in wildlife management. Candidates may work for the Ph.D. in zoology through the Wildlife Research Unit. Candidates for fellowships should submit formal applications with a transcript of college credits and letters of reference by March 1.

For further information with regard to curricula and requirements for graduate work in the wildlife field, write to the Unit Leader, Dean of the School of Forestry or Chairman of the Department of Zoology.

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 are the agencies through which the University carries on off-campus activities and services. These agencies work directly with communities in surveys, institutes, forums, short courses, conferences and community action programs. Included are the School for Administrative Leadership and the Division of Indian Services. The Division of Indian Services is a council which keeps abreast of Indian affairs and advises the University about federal programs and services which the Division of Continuing Education and Public Service could provide to the Indian community.

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.

admission . . .

HIGH SCHOOL PREPARATION . . . Although general admission to the University is granted as indicated below, additional units of high school work are needed for certain professional curricula. High school courses should be chosen to meet requirements for the curriculum selected, otherwise additional time may be required in college. The student should check the curriculum of his choice and take in high school those courses listed as "needed" where such courses are indicated under "High School Preparation." The "recommended courses" under "High School Preparation" would be helpful, but no loss of time would be involved if the student did not take them in high school.

CREDENTIALS . . . Applications for admission should be sent to the Director of Admissions, University of Montana, Missoula, Montana 59801, on forms which may be obtained from high school principals or by writing to the director of admissions at the University. Applications should be sent in at least a month before registration. The following credentials are required: (a) completed application and high

school transcript on forms provided by the University of Montana; (b) official transcript from each college attended, including institutions attended while in military service, carrying a statement of honorable dismissal from the last college attended; and (c) a completed University Health Record Form signed by a qualified physician and mailed by him directly to the University Health Service.

ADVANCE REGISTRATION FEE . . . For all new applicants, except graduate students, a registration fee of \$15 (\$22.50 semester) must accompany the application for admission. If the student registers, this fee is credited to him as payment of the registration fee for the quarter (semester) for which application was made (see **STUDENT FEES**), but it is not refundable if the student fails to register for the term indicated for entrance. This fee will be refunded if admission is refused.

TESTING . . . All new freshmen, and transfer students with less than a full year in college, are required to take the **AMERICAN COLLEGE TESTING PROGRAM** examination preferably in October or December. The test also is offered in February, May and August. 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 **REGISTRAR**, University of Montana, Missoula, Montana 59801.

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

New freshmen who do not take the **AMERICAN COLLEGE TESTING PROGRAM** examination in advance and have the results sent to the University will pay a \$6 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
Educational Testing Service
Princeton, New Jersey 08540

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

GENERAL REQUIREMENTS . . . Applicants for admission must be of good moral character. Veterans of any branch of the United States Armed Forces should present a discharge marked other than "dishonorable."

RESIDENT: Graduates of any fully accredited Montana high school who are legal residents of Montana are admitted to regular standing. The completion of a high school or preparatory course of four years, including three years of English and one year of American history and government, is the standard for general admission.

NON-RESIDENT: Entering freshmen must be in the upper 50 per cent of their high school graduating class. If rank in class is not available, scores from the ACT (or College Board Test, requiring a separate English placement exam) will be used to establish the equivalent level of competency.

BY EXAMINATION: A person not a graduate of an accredited high school may be admitted by proving competency on examinations. The examinations, on not less than fifteen units of secondary school work, must cover the specifically required courses in English and American history and government. Credit is allowed for any courses taken in an accredited high school.

The State Superintendent of Public Instruction issues a high school equivalency certificate under authorization of the State Board of Education on the basis of the General Educational Development Tests. These certificates are granted to service personnel, honorably discharged veterans and non-veteran adults, provided the applicant meets requirements. Detailed information will be sent on request.

EARLY: A limited number of high school students who have completed their junior year may be granted early admission with specific agreement and recommendation of the high school and the University.

CONDITIONAL: A person who has attended an accredited high school for four years, but lacks one course for graduation (other than required courses in English and American history and government), may be admitted on condition that the deficiency be made up within a year.

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

Non-resident transfer students must meet all the requirements above for Montana transfers and have a transcript proving a C average on all college work attempted.

Changing schools or objectives may result in loss of time. Excess credits earned in completing a two-year course of junior college rank may not be used to decrease the two years usually required to complete senior college work at the University of Montana.

ADVANCED PLACEMENT: High school students who took college level courses agreed upon in advance by the high school and the University may be admitted with advanced placement. Validation will be determined by the University from scores earned by the student on University-constructed examinations or on the advanced placement section of the College Entrance Examination Board.

UNCLASSIFIED: Under certain circumstances, older students, permitted to select courses without reference to the requirements of any prescribed course of study, may register as unclassified students.

AS A SPECIAL STUDENT: Persons 21 years of age or over who are not graduates of high schools, who cannot meet all the requirements for admission and who are not candidates for degrees, may be admitted upon passing general aptitude and English placement tests. The University may accept students who show satisfactory evidence that they are prepared to pursue successfully college courses.

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

registration . . .

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

ORIENTATION WEEK . . . The first week of autumn quarter is set aside for the orientation and registration of new students. The program includes: (1) acquainting the student with the campus, the classroom buildings and residence halls; (2) explaining the University program in detail—the types of instruction offered and the careers for which a student may prepare at the University; (3) various tests to help the student determine University aptitudes and the courses in which he or she will learn most effectively; (4) social gatherings at which students become acquainted with fellow classmen, students of other classes and members of the faculty; and (5) official registration in the University, with the assistance of a member of the faculty in the selection of courses.

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

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

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

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

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

degrees and majors . . .

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

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

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

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

COLLEGE OF ARTS AND SCIENCES

Bachelor of Arts, with majors in:

Anthropology	Mathematics
Biology	Microbiology
Botany	Philosophy
Chemistry	Physics
Economics	Political Science
Economics-Political Science	Political Science-Economics
Economic-Sociology	Political Science-History
English	Pre-Medical Sciences
French	Psychology
Geography	Recreation
Geology	Social Welfare
German	Sociology
Health and Physical Education	Sociology-Economics
History	Spanish
History-Political Science	Speech Communication
Home Economics	Speech Pathology and Audiology
Latin	Zoology
Liberal Arts	

Bachelor of Science, with majors in Chemistry, Health and Physical Education, Home Economics and Recreation

Bachelor of Science in Medical Technology, Physical Therapy and Wildlife Technology

PROFESSIONAL SCHOOLS

- Bachelor of Arts in Business Administration
- Bachelor of Science in Business Administration
- Bachelor of Arts in Education
- Bachelor of Arts, from the School of Fine Arts, with majors in Art, Drama or Music
- Bachelor of Fine Arts with major in Art
- Bachelor of Music, from the School of Fine Arts, with majors in Applied Music, Music Education, Theory or Composition
- 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

- Bachelor of Laws
- Juris Doctor

academic requirements . . .

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

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

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

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

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

Number of Credits Attempted	Minimum Cumulative GPA Required
1-44	1.5
45-89	1.6
90-134	1.7
135-149	1.8
150 or more	1.9

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

Students entering autumn quarter 1962 and thereafter who at the end of any quarter do not, based on credits attempted, attain and maintain grade-point averages (GPA's) as shown above are placed on scholastic probation.

Students on probation are urged to check in at the Counseling and Testing Center for possible assistance.

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

A student dropped for the first time, after the lapse of three quarters from the time dropped, may be readmitted upon application to the registrar. A student thus readmitted is on scholastic probation.

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

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

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

INDEPENDENT WORK . . . Credit is allowed superior students of junior and senior standing for independent work in topics or problems chosen by themselves with the approval of the departments concerned and with the supervision of instructors. Such work must be registered for at the beginning of the quarter. The student cannot obtain a larger number of credits than he is registered for, but a smaller number may be completed and credit obtained with the instructor's approval.

CREDIT BY EXAMINATION . . . Under certain circumstances, a student may challenge and receive credit for a course in which he has not been regularly registered. The challenge system does not apply to law or pre-law courses. Each school or department determines which, if any, courses within the department may be challenged. The dean of the school or head of the department must approve any arrangements prior to testing for challenge credit.

A student must have a 2.0 grade average in all courses for which he has registered and an entering freshman must have a scholastic record equivalent to a 2.0 grade average in order to challenge a course.

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

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

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

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

GRADING SYSTEM . . . The class work of the student will be rated on a system of letter grades:

A—work of the best grade; B—work better than average; C—average work; D—work below average, but barely passing; F—failure; P—pass without defining the grade, applies only to (1) non-credit courses and (2) certain seminars and other courses in the 500-600 series stressing independent work, which are designated by the department or school and announced in advance. The P grade must apply to all registrants in the course. The grade I—incomplete, is given if all the work in a course has not been completed and there is sufficient reason for this. An I will be changed to an F if the work is not completed during the student's next quarter of attendance.

In research and thesis courses, the letter "N" not accompanied by a grade is assigned at the end of each quarter to indicate that the student is entitled to continue the course. Completing the course, the student is assigned a grade which applies to the whole course.

Grade points are computed as follows: 4 grade points for each credit of A; 3 grade points for each credit of B; 2 grade points for each credit of C; and 1 grade point for each credit of D.

The cumulative grade-point average is computed by dividing total grade points earned by the total number of hours undertaken, excluding non-credit courses and courses assigned W, P, I or N.

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

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

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

(1) Physical education, 6 quarters (6 credits), required of all students unless excused for cause. Discharged veterans and students 27 or more years of age are excused from this requirement.

(2) English composition. Unless exempted by the English department, all students are required to complete the English 150-250-350 sequence (3 quarters, 9 credit). All students, unless exempted by the English department, *must take English 150 during their freshman year.* English 250 and 350 may be taken during any two of the three remaining years, *but in no case will any student be allowed to take both English 250 and English 350 in the same year.*

Placement in English is determined from the ACT examination. Those who fail to demonstrate an acceptable college standard must take English 001 without credit and receive a "pass" before enrolling in English 150. English 001 is offered through the Extension Division.

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

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

A. At least 12 credits in Group I or Group II, with at least one quarter in a laboratory course and at least 8 of the 12 credits in one discipline; *and* an additional course of at least 3 credits in the other group.

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

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

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Group I Life Sciences

Biology: Only General 131-132
Botany: All courses
Microbiology: All courses
Psychology: Only 206, 212, 310-311-312
Zoology: All courses

Group II Physical Sciences and Mathematics

Chemistry: All courses
Geology: All except 300, 301, 302, 306
Mathematics: All except 130, 220, 249
Physics: All courses

Group III Social Sciences

Anthropology: All except 358
Economics: All courses
Geography: All except 301, 302, 360, 370, 371
Political Science: All courses
Sociology: All except 204 and 205

Group IV Humanities

Art: Art History courses 200-202, 380-389, 393-394
Drama: 112, 261-262-263, 301-302-303
General: Only 151-152-153
History: All except 392-393-394
Literature: English and all lit. courses except 161, 162;
Foreign Languages: all lit. courses except 211, 212 when offered to meet foreign language requirements.
Music: Either 134 or 135
Philosophy: All except 210, 301, 302, 303
Religion: All courses

Students in the combination major, history and political science, may meet only Group III or Group IV requirements with courses in history and political science.

Elementary education majors may meet requirements in Group I and II with General 125-126-127 and 9 credits in mathematics excepting 249.

Forestry 421, Forest Economics, may apply to Group III for degrees in forestry.

FOREIGN LANGUAGE REQUIREMENT . . . For the degree of bachelor of arts from the College of Arts and Sciences, bachelor of arts from the School of Fine Arts, Bachelor of Arts in Business Administration and Bachelor of Arts in Journalism, a knowledge of either a modern or classical foreign language is required. Particular languages (e.g. French, German) may be specified by certain departments or schools. Provided the languages involved are acceptable to the student's major department, this requirement may be met in any of the following ways: (1) by 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 the University, five quarters of one language or three quarters in each of two languages; (3) by a combination of high school and University foreign language study acceptable to the foreign language 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. Undergraduate reading examinations are given and certified by the foreign language department. Arrangements for such examinations must be made by the end of the fourth week of any quarter. The examination will be given on the seventh Saturday of the quarter.

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

RESIDENCE REQUIREMENTS . . . Students who transfer credits earned elsewhere and seek a degree from the University must, in addition to meeting other requirements, earn not less than 45 credits and devote not less than three quarters to 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.

requirements for graduation . . .

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

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

CREDITS REQUIRED FOR A DEGREE . . . Normally credits assigned to a course are equated in the following way: one credit for each 50 minutes of lecture with two hours of preparation for the lecture expected of the student. Credit granted for laboratory work is normally one credit hour per two or three hours laboratory session. A total of 180 credits plus six credits earned in required physical education and any credits in basic ROTC is necessary in all courses for graduation with a bachelor's degree except that more are required in forestry, law and pharmacy. Candidates for the degree of Bachelor of Science in Forestry must complete 192 credits in addition to regular requirements in physical education. Candidates for the degree of Bachelor of Laws or Juris Doctor must complete three years of law totaling 90 semester hours in addition to the entrance requirements of the School of Law. Admission requirements of candidates for the degree of Juris Doctor include graduation from an approved college or university. Candidates for the degree of Bachelor of Science in Pharmacy must complete a five-year course. Candidates for the bachelor of arts degree from the College of Arts and Sciences must complete 93 credits in that college, except that credits in art and drama may be included.

CREDITS REQUIRED FOR A MAJOR . . . Students may be required to complete from 45 to 70 credits in the chosen field. For degrees in education, the number of credits is from 40 to 70. In curricula allowing 5 credits of a survey course to count as part of major requirements, the total maximum of 70 credits allowed in the major includes these 5 credits. This rule on maximum credits allowed does not apply in the Schools of Business Administration, Forestry, Journalism, Law, Pharmacy and the music department in the School of Fine Arts. 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 70 credits in one foreign language and not more than 90 credits in all foreign languages may be counted toward graduation in that area.

Not more than 18 credits in advanced ROTC courses nor 15 credits in religion may be counted toward graduation. Credit in denominational religion courses is not accepted.

Except in the music department, not more than 12 credits in applied music (Music 100, 101 through 403, 151 through 453, 114 through 119; 125, 126, 127, 129) 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 19 credits earned in Business Administration 180-181-182, 183, 184-185-186, 187-188-189 and 190-191.

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

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

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

GRADUATION WITH HONORS OR HIGH HONORS . . . A student with a grade-point average at the beginning of his 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, must pass an honors examination (written or oral) administered by the department or school. The results of such examinations are to be certified by the department chairman or dean to the registrar as "A" or "B" level.

A student who transfers credits earned elsewhere to this university must meet these requirements on grades earned at the University of Montana as well as on his entire record.

After these qualifications have been met, the candidate for honors or high honors must receive the recommendations of his major department and the faculty of the University of Montana.

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

summer session . . .

The summer session consists of two 4½ week half-sessions and a concurrent nine-week session. Students may attend either half-session or the full nine-week session. The 1969 summer session will open June 23 and close August 22; the first half-session, June 23 to July 23; the second half-session, July 24 to August 22.

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

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

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

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

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

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

the graduate school . . .

For information on graduate degrees offered, admission to the Graduate School, general requirements for graduate degrees and graduate courses, write to the dean of the Graduate School. For a copy of the Graduate School Catalog, send complete return address, including zip code number.

Detailed information on requirements for particular degrees may be secured by writing to the dean of the school or the department chairman involved.

financial obligations . . .

PAYMENT OF FEES by check in exact amount of bill is preferable. The University does not accept non-bankable paper in payment of bills. Personal checks are not cashed except in payment of University bills.

SUMMARY OF EXPENSES . . . This does not include fees for special purposes such as applied music and forestry.

Married students living in University-operated family housing pay rental rates varying from \$60 to \$101.50 a month depending on the size and type of apartment.

Board and room rates probably will hold for the year. However, in the event of material increases in costs, rates may be increased accordingly.

Montana Resident	Autumn Quarter	Winter Quarter	Spring Quarter	Total For Year
Fees*	\$125.00	\$123.00	\$123.00	\$ 371.00
Res. Halls Board	200.00	175.00	175.00	550.00
Room (Double)	88.00	88.00	88.00	264.00
Books, Supplies, Est. . .	50.00	50.00	50.00	150.00
Total Mont. Res.	463.00	436.00	436.00	1,335.00
Students not residents of Montana add:	202.50	202.50	202.50	607.50
Total non-res.	665.50	638.50	638.50	1,942.50

*Includes \$2 Student Identification Card, first quarter of attendance (paid once each year). A motor vehicle registration fee of \$3 per quarter is paid in full each year for the quarters remaining when the student first enrolls during the school year (fall, \$9; winter, \$6; spring, \$3). Refunds are made for quarters paid for, but not attended.

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

STUDENT FEES . . . The following is a detailed schedule of quarterly fees authorized for the University year 1967-68 in all schools and departments except where otherwise specified. For the law school, which is on a semester plan, the semester fees will be 50% above the quarterly fees. Fees are subject to modification by action of the State Board of Regents.

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

The University offers no deferred payment plans. Students are expected to make financial arrangements prior to registration. The Financial Aid Office will try to help you solve your financial problems.

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ALL STUDENTS REGISTERED FOR SEVEN OR MORE CREDITS

Registration	\$ 15.00
(Many honor scholarships entitle the holder to a waiver of the registration and incidental fees)	
Incidental (for laboratory supplies in all courses, diploma, etc.)	50.00
Building	20.00
Student Union Building	10.00
Student Activity	15.00
For support of activities sponsored by the Associated Students of the University of Montana. (Optional to students who have a B.A. or B.S. degree and to students registered for less than seven credits.)	
Health Service	13.00
(Required of all students enrolled for class work.)	
	<hr/>
	\$123.00
Student Identification Card (paid once a year)	\$ 2.00
Motor Vehicle Registration Fee (drivers only)	3.00

Total first quarter in attendance	\$125 or \$134.00
Non-residents (out-of-state) pay, in addition to the fees listed above, per quarter (\$180.00 plus \$22.50 building fee)	\$202.50
(If registered for less than 7 credits, the non-resident fee is based on a charge of \$26.00 per credit, plus an \$11.25 non-resident building fee.)	

Refer to the forestry and music sections for information on additional forestry and music fees.

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

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

LIMITED REGISTRANTS (students registered for less than seven credits): registration fee \$15; incidental fee \$25; building fee \$10; Student Union Building \$5; Health Service \$13; student activity \$15 (optional). Non-residents pay (in addition to other fees stated here) \$26 per credit, plus \$11.25 additional non-resident building fee. Students who are enrolled as regular students who wish to drop to limited registrants should see statements under regular refund schedule.

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

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

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

FEES FOR SPECIAL PURPOSES . . .

LATE REGISTRATION: Payable by students who did not register during the period designated for registration, unless their late registration was due to the fault of the University. The fee also is payable by students who register during the prescribed registration period except for payment of fees. If a bank declines payment of a personal student check and

returns it to the University and such action is due to fault of the student, the fee shall be charged from the date of the check tendered by the student to the University. (\$5 for the first day, plus \$2 per day thereafter to a maximum of \$15.)

CHANGE OF ENROLLMENT: Effective the fourth day of classes, \$2.

SPECIAL EXAMINATION: For each special examination, \$2; maximum, \$5 for any one quarter.

REMOVAL OF INCOMPLETE: \$2 per course.

TRANSCRIPT OF RECORD: \$1 each after the first which is free of charge.

CREDIT BY EXAMINATION: A fee of \$3 per credit hour is charged.

FIELD TRIPS: Certain departments require field trips, the cost of which is a personal expense prorated among the students in the course. Check the department involved for such courses.

SUMMER FEES are listed in the Summer Session and Biological Station bulletins.

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

Applied music refund is based on a charge of \$1.75 per ½-hour lesson for the number of weeks elapsed since the beginning of the quarter.

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

REGULAR STUDENTS	Week of Instruction		
	First	Second	Third
Registration	None	None	None
Incidental	75%	50%	50%
Building	100%	50%	50%
Student Union Building	None	None	None
Student Activity	100%	50%	50%
Health Service	100%	50%	50%
(No refund if medical service furnished or physical examination taken.)			
Non-Resident Tuition	80%	60%	40%

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

REGULAR STUDENTS WHO DROP TO LIMITED REGISTRANTS

Registration	None	None	None
Incidental	40%	20%	20%
Building	50%	25%	25%
Student Union Building	None	None	None
Student Activity	100%	50%	50%
Health Service	None	None	None
Non-Resident Tuition	Varies with number of credits		

student organizations and services . . .

At the University of Montana, student services are coordinated through the offices of the dean and associate dean of students. Satisfactory student growth—socially, emotionally and educationally—is the purpose of the program. Student services concerned with the welfare of students include the Counseling and Testing Center, Health Service, Placement Service, Student Housing, Student Union, Financial Aid Office and the Food Service.

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.

THE OFFICE OF THE DEAN OF STUDENTS has general supervision over all student welfare. The associate dean has specific responsibility for the social and academic welfare of women students.

OFFICIAL RECOGNITION OF STUDENT ORGANIZATIONS . . . Every student organization is required to register with and obtain recognition from the Dean of Students Office. Until such recognition has been granted, an organization is not entitled to the use of space in campus buildings, mention of its activities in campus publications 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.

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

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

THE COUNSELING AND TESTING CENTER has a general function of giving guidance and assistance to students in the following areas: (1) selection of appropriate area of major study; (2) assessment of abilities and the most efficient, effective application of those abilities to allow for maximum learning in college; (3) diagnoses of difficulties leading to less than 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 for students to 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 activities contrary to University regulations or due to use of alcohol are not covered. Injuries resulting from automobile accidents are not covered; therefore, it is advised that automobile insurance be adequate to take care of medical costs.

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

THE OPTIONAL BLUE CROSS SUPPLEMENTAL HEALTH PLAN has been worked out through the Faculty-Student Health Committee to make it possible for students to obtain low-cost year-around health care protection during the four or more years they are undergraduates at the University of Montana and to allow married students health care protection for their dependents. Under this plan, which costs the single student \$3 per quarter for the autumn, winter and spring quarters and \$4.50 for the summer, the student may protect himself against the costs of illnesses that exceed 15 days per quarter of hospitalization (the limit under the Student Health Service Plan) and illness and accidents occurring between quarters and during the summer months. The married student, under this optional plan, can gain health care protection for his dependents, who cannot be covered under the University plan, at a cost of \$16.95 per quarter for the autumn, winter and spring quarters and for the summer session. Details of the plan are available from Montana Blue Cross, 3360 10th Avenue South, Great Falls, from the Dean of Students Office and from the University Health Service.

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

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

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

University placement services are provided free of charge to graduates except for a \$5 fee for compiling credentials. No additional charge is made in subsequent years. All University students are invited to make use of these services. The Placement Center is located in the Liberal Arts Building.

STUDENT HOUSING includes eight residence halls, two housing areas for married students, a women's cooperative house and nine fraternity and six sorority houses. Rooms are available also in private homes in Missoula.

REGULATIONS . . . Freshman students, both men and women, who are unmarried and under 21 years of age and who are not living in their own homes while attending the

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University are required to live in University residence halls unless excused as special cases by the dean or associate dean of students.

Upperclass, unmarried, undergraduate women under the age of 21 are required to live in the women's residence halls or with approved student living groups unless excused as special cases by the associate dean of students.

Junior women (minimum 90 credits) who have parental permission and senior women (minimum 135 credits) may choose to live in a "no-hours" residence hall.

Women students whose twenty-first birthday occurs during the period of an academic quarter are required to live in the residence halls or with approved living groups until the end of that quarter. Thereafter, they may move to other quarters if they so wish.

Women between the ages of 21 and 24, inclusive, may live in the residence halls only as space is, or becomes, available. Women students over 21 who are admitted to the residence halls will be required to remain there for all quarters of the academic year.

Women students 25 years of age or over, or married women, must have special permission of the associate dean of students to live in residence halls.

All students who contract to live in the residence halls do so for the entire academic year or that portion of it for which they are enrolled.

RESIDENCE HALLS AND FOOD SERVICE . . . Application forms and detailed information may be obtained by writing the Admissions Office, University of Montana. A prepayment on board and room, as announced in the residence halls bulletin, must accompany each room application. If a room reservation is canceled, notice in writing must be received by the manager of residence halls on or before September 21 for fall quarter, January 2 for winter quarter and March 25 for spring quarter. Students who live in the residence halls are required to board at the Food Service. See Residence Halls Bulletin for board and room rates.

Dormitory charges must be paid in advance at the beginning of the quarter or in installments as arranged with the University of Montana TREASURER.

An installment payment plan is available to aid students who might not be able to enroll by making available a schedule of payments throughout the year in lieu of the usual large initial payment each quarter for regular fees and board and room. An additional charge of \$7 a year is assessed to those who wish to use the installment plan. Inquiries regarding this plan should be addressed to the Business Office, University of Montana, Missoula, Montana 59801.

Social life in the halls is encouraged through residence hall clubs and numerous activities. Adult counselors cooperate with the students in making living in the halls enjoyable and beneficial. A fee of \$2 per quarter is assessed the residents in each hall. This fund is expended for social activities which are planned by the group.

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

All University food and housing operations are conducted on a self-sustaining basis. Land is acquired, buildings are built and maintenance and operation are financed out of payments for such housing or meals. When costs go up, charges for these services must go up unless the services themselves are to be 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, with one, two, three and four bedrooms are available.

THE WOMEN'S COOPERATIVE HOUSE provides an opportunity for women to gain experience in group living while reducing living expenses by sharing in the work of the

house. This residence is under supervision of an approved housemother. Information may be obtained by writing to the President, Synadelphic House, in care of the Dean of Students Office.

FRATERNITY AND SORORITY HOUSES . . . Nine national fraternities and six national sororities maintain their own residences under University supervision. Membership in fraternities and sororities is by invitation, but eligibility for pledging is based on satisfactory scholarship accomplished 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.

STUDENT UNION . . . During the 1968-69 academic year, the new \$4 million University Center will replace the Lodge as the center of student life and activities. The new center will house significantly expanded student social and governmental activities. It will include student legislative chambers, offices, lounges, work areas, music listening rooms, hobbies and craft areas, art gallery, conference areas, ballroom, coffee shops, bowling lanes, billiard areas and food services. In addition, students have access to a nine-hole golf course and a large modern swimming pool.

FINANCIAL AID . . .

EDUCATIONAL LOANS: National Defense, United Student Aid and Henry Strong loans, as well as loans from University sources, are available to qualified students in need of financial aid to complete their college work. Information about these may be obtained from the Financial Aid Office.

WORK-STUDY PROGRAM: Students from low-income families may receive financial assistance through the federally sponsored Work-Study program. This program makes it possible for students to combine campus employment with loans and/or grants in financing their university education. For detailed information on this program, write the Financial Aid Office.

EDUCATIONAL OPPORTUNITY GRANTS: For those who qualify on a basis of need, federal education opportunity grants are available to undergraduates. For detailed information, write the Financial Aid Office.

FINANCIAL NEED ANALYSIS. The University of Montana participates in the College Scholarship Service (CSS) and the ACT Student Need Analysis Program, which assist colleges and universities in determining the student's need for financial assistance. Entering freshmen seeking financial help through loans, grants or the Work-Study program should submit a copy of the Parent's Confidential Statement (PCS) form to the College Scholarship Service or the Family Financial Statement to ACT by March 1. The student should indicate on the statement that he intends to enroll at the University of Montana. The forms may be obtained from a secondary school or the University Financial Aid Office.

SCHOLARSHIPS AND PRIZES: The University offers many rewards for outstanding academic achievement. Many are available through the generosity of friends and alumni of the University. Graduate scholarships are administered by the graduate dean and undergraduate scholarships by the dean of students. Prize awards relating to specific departments are awarded by the department concerned.

standards of student conduct . . .

Personal honor and self-discipline play a large part in one's success in the University. A record, built during undergraduate years, for integrity and personal honor is as important for future success as academic accomplishment. The policy of the University, therefore, is pointed toward student development along both lines.

This policy begins with the assumption that all students coming to the University have common sense and normal conceptions of honor, morality, integrity and respect for order and the rights of others. It also assumes that all students have a respect for the University and regard their attendance here as a privilege and not a right; that, in a

sense, each generation of students feels it has a responsible stewardship and desires to leave for future generations of students a University even better in fame and reputation than the one they have known.

Because of these assumptions, it is unnecessary to spell out a long list of restrictions and laws that are essential in a less selective community to protect the rights of the responsible from those who are not.

Every student knows that to be personally honorable he cannot lie, cheat, steal, be destructive of public or private property, participate in riotous activity, be guilty of immoral acts or indecency, be inconsiderate of the rights and lives of others or be oblivious to the laws of city, state or nation. Guilt in any of these areas, he knows, is not good citizenship and can result in the withdrawal of his privilege of attending the University.

Consistent with the above, therefore, the University expects all of its students to conform to the usual standards of society and law-abiding citizenship. Every organization affiliated with the University or using its name is expected to conduct all its affairs in a manner creditable to the University. Organizations and individuals will be held to this principle.

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.

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.).

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. Students violating this regulation are liable to suspension. Furthermore, University students are expected to abide by state and federal laws in the use or possession of intoxicating liquor or drugs.

DRUGS . . . Use, sale or possession of various drugs including opium, heroin, cannabis, marijuana, Indian hemp, peyote, mescaline and others are made illegal under both federal and state laws. The punishment for violating these laws is very severe with conviction resulting in long-term imprisonment (usually two to forty years) and with special limitations on the convicted drug offender's right to probation and parole. Further, with the advent of LSD and STP and the increasing use of stimulants or depressants, the federal law has been broadened to include barbiturates, amphetamines and other non-narcotic drugs with similar effects on the central nervous system. The penalties for illicit traffic in these drugs is less severe, usually a fine or imprisonment for less than two years. This is the law. It is harsh. Every student should be fully aware of the risks involved in violating the drug laws.

The illegal use or sale of drugs is also a violation of University regulations. Therefore, it is essential that the University take action toward any student who illegally uses or sells drugs. The University may refer the student drug offender to professional rehabilitative services, may place him on probation, may suspend him, may expel him or may take such other action as it deems justifiable under the circumstances of the case. However, the action taken by the University will in no case be directed toward punishing the drug offender but only toward achieving the fundamental University objectives of helping the individual student and pro-

viding the best possible educational environment for the entire student body.

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.

FALSIFICATION OR WILLFUL SUPPRESSION of any information called for on any University form will be grounds for cancellation of registration. This includes falsification of advisers' signatures on program request cards.

RIGHT OF APPEAL . . . Students who for disciplinary reasons have been suspended or expelled from the University have a right to appeal by letter to a faculty-student Board of Judicial Review within three academic days following their suspension.

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

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

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

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

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.

ABSENCE FROM CLASS . . .

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

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

DUE TO FIELD TRIPS: At least two weeks in advance of a proposed field trip, the instructor in charge should send a memorandum to the dean of his school or college stating the proposed 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. Each

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student is responsible for having his cards signed by his various instructors and returned to the Dean of Students Office for filing.

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

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

organization of instruction . . .

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

COLLEGE OF ARTS AND SCIENCES

Anthropology	Library Service (no major)
Biology	Mathematics
Botany	Medical Technology
Chemistry	Microbiology
Computer Science (no major)	Philosophy
Economics	Physical Therapy
English	Physics
Foreign Languages	Political Science
French	Pre-Medical Sciences
German	Psychology
Greek (no major)	Reserve Officers Training Corps
Italian (no major)	Air Science (no major)
Latin	Military Science (no major)
Russian	Sociology and Social Welfare
Spanish	Speech-Communication
Geography	Speech Pathology and Audiology
Geology	Speech Communication
Health and Physical Education	Wildlife Biology
History	Zoology
Home Economics	
Liberal Arts	

GRADUATE SCHOOL

SCHOOL OF BUSINESS ADMINISTRATION

Accounting	Management
Business Education	Marketing
Finance	Office Management
General Business	

SCHOOL OF EDUCATION

Administration and Supervision
Elementary Education
Guidance and Counseling
Library Service
Secondary Education

THE SCHOOL OF FINE ARTS

Art	Music (continued)
Drama	Applied Music
Music	Organ
Music Education	Piano
Elementary Teacher Training	String Instruments
Secondary Teacher Training	Voice
Music History and Literature	Wind Instruments
	Theory or Composition

SCHOOL OF FORESTRY

Forestry	Conservation
Forest Management	Watershed Management
Forest Engineering	Soil and Water Conservation
Wood Utilization	Wildlife Conservation
Range Management	Range Conservation
Wildlife Management	
Forest Recreation	

SCHOOL OF JOURNALISM

Advertising Magazines	News-Editorial Radio-Television
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SCHOOL OF LAW

SCHOOL OF PHARMACY

AFFILIATED SCHOOL OF RELIGION (no major)

course numbering system . . .

001-099	Courses below college level. No college credit given.
100-199	Freshman Courses
200-299	Sophomore courses
300-399	Junior courses
400-499	Senior courses
500-699	Graduate courses

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

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

Thesis and independent studies courses may be so listed as to provide for 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:

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

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

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

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

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

LECTURE AND LABORATORY: (3-4) illustrates a class with 3 hours of lecture 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.

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.

courses of instruction . . .

ANTHROPOLOGY

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



SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE:

In addition to the general requirements for graduation listed earlier in the catalog, 50 credits in anthropology courses or approved cognate courses listed below are required for the Bachelor of Arts degree. A foreign language is required. (See foreign language requirement in the general section of the catalog.) Credits taken in anthropology must include the following courses: Anth 152, 153, 358, 371, 372, and 380. In addition, one course in ethnology and one course in archaeology must be taken. The following sociology courses must be completed: Soc. 101, 201, and 205. General 360, Geography 335, Religion toward a major in anthropology. A minimum of 35 of the 50 credits required must be in anthropology courses.

GRADUATE WORK. See Graduate School

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

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

153 **CULTURAL ANTHROPOLOGY** 5. The social life of man; his family structures, his groups and institutions—economic life, religion, political forms, education, and arts.

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

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

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 308)

325 ***MUSEUM TECHNIQUES** 3. A general course in cataloging, repairing, and displaying archaeological, ethnological and historical materials and small museum operation.

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

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

352 ***ARCHAEOLOGY OF MONTANA** 3 prereq 152 or 153 or =, and c/i. The origins and distribution 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 **ARCHAEOLOGICAL SURVEY** Any quarter in which field parties are organized. V 3-9 R-18 prereq 152 or 153 or =. A field course in Montana archaeology.

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

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

358 **PHYSICAL ANTHROPOLOGY** 4 prereq 152 or =. The history, evolution, and present nature of man's bodily structure. Identification and determination of age and sex of human osteological materials.

360 ***INDIANS OF THE SOUTHWESTERN UNITED STATES** 3 prereq 152 or =. The development of Indian cultures in southwestern United States from the most ancient evidences of man to the present.

361 **INDIANS OF NORTH AMERICA** 4, Su 3 prereq 152 or 153 or =. The native cultures of North America, north of the Rio Grande.

362 ***INDIANS OF SOUTH AMERICA** 4 prereq 152 or 153 or =. The cultures of the Indians of South America.

363 ***PEOPLES OF AFRICA** 4, Su 3 prereq 152 or 153 or =. The aboriginal cultures of Africa.

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

366 **NORTHWEST ETHNOLOGY** Any quarter in which field parties are organized. V 1-5 R-15 prereq 152 or 153 or =. A field course. Indian tribes of Montana and related areas.

368 ***PEOPLES OF THE PACIFIC** 4 prereq 152 or 153 or =. The peoples who inhabit the islands of the Pacific Ocean, including Polynesia, Melanesia. Micronesia and larger islands around Australia.

369 ***PEOPLES OF CENTRAL AMERICA** 4 prereq 152 or 153. The prehistoric remains of high civilizations, ethnic groups, and the effects of European contact on these cultures.

371 **CULTURE AND PERSONALITY** 4 prereq 152 or 153 or =. The role of culture in the formation of personality.

372 **CULTURE AND THEORY** 4 prereq 152 or 153 or =, and Soc. 310. The development of theory and method in cultural anthropology to the present. Various archaeological, ethnological, and socio-psychological theories in the light of historical anthropology.

380 ***HISTORICAL LINGUISTICS** 4 prereq 152 or 153 or =, and Gen 360. Some significant theories and methodological assumptions of selected schools of linguistic theory.

383 **LANGUAGE AND CULTURE** 3 prereq 152 or 153 or =. Analysis of relationships between languages and cultures of the world.

385 **PEOPLES OF THE FAR EAST** 4 prereq 152 or 153 or =. The peoples and culture of China, Japan, Korea, Southern Asia, and adjacent areas.

386 **PEOPLES OF WESTERN ASIA** 4 prereq 152 or 153 or =. The peoples and culture of the area from the Mediterranean Near East to India.

390-391-392 **PRO-SEMINAR** V R-9.

451 **ADVANCED PROBLEMS** V 1-2 R-6 prereq 152 or 153 or =, and c/i.

452 **MODERN INDIAN PROBLEMS** 3 prereq 152 or 153 or =. Social and health problems, legislation, education, and economic conditions of Indians of the United States.

453 **SOCIAL ANTHROPOLOGY** 3 prereq 152 or 153 or =. The principles and theories of social organization and institutions.

473 ***CULTURAL DYNAMICS** 3 prereq 152 and 153. The processes of cultural change, acculturation and integration.

480 ***LINGUISTIC METHODS** 3 prereq 152 or 153 or =, and Gen 360 or Spch 119. Phonemic, morphological and semantic analysis of an unwritten language, using a native informant.

FOR GRADUATES

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

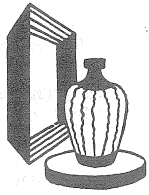
551 **RESEARCH** V.

580-581-582 **GRADUATE SEMINAR** V R-15. Selected problems in anthropology.

699 **THESIS** V R-9.

ART

is man's visual means of communication and expression in two and three dimensional form. The art curriculum aims at developing the most effective skills and knowledge possible for each student who is concerned with becoming competent in such visual communication-expression. A student may choose to emphasize one area of art somewhat more than others as a preparation for a particular type of career. The important areas are: drawing, design, painting, sculpture, ceramics, printmaking, and history of art. Careers are to be found in teaching, in a great variety of commercial areas, and in the "free-lance" or independent field.



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

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

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN ART. In addition to the general requirements for graduation listed earlier in the catalog the following requirements must be completed for the Bachelor of Arts Degree with a major in Art: 55 or more credits (up to a maximum of 70) including Art 123 (9 cr.) 125-126-127, 200-201-202, 235 (9 cr.), 240 (9 cr.), and 323 (4 cr.). The Foreign Language requirement listed earlier in the catalog must be satisfied.

The Bachelor of Fine Arts is a professional degree which requires a minimum of 90 credits in art, including the courses listed for the B.A., and 90 credits outside the department. A foreign language is not required. The degree is planned for a limited number of students of superior ability. A student may apply at the beginning of the Sophomore year and is expected to have a 3.0 index in Art and 2.5 in academic work. A portfolio or slides must be presented for a staff jury.

Specific requirements may be obtained from the Art Department upon request.

Suggested first year program:

	Quarter		
	A	W	S
	Cr.	Cr.	Cr.
Art 123	3	3	3
Art 125-126-127	1	2	2
Art 129	2	2	
English 150, Electives	3	3	3
Elective from Groups or Lang.	5	5	7
H & PE 100	1	1	1

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

123 DRAWING 3, Su 2, R-9. Variable credit by extension. Objective and expressive drawing, using varied methods and subject matter.

125-126-127 DESIGN 2. Creative design and use of color theories, methods and problems.

129 CERAMICS 2 R-4. Clay projects, building, throwing, glazing, and firing. Offered for one credit by extension.

160 LAYOUT AND LETTERING 2. Pen and brush lettering, layout, and design techniques.

200 SURVEY OF WESTERN ART: THE ANCIENT WORLD 3. Prehistory, Egyptian, Ancient Near East, Greek, Etruscan, Roman.

201 SURVEY OF WESTERN ART: EARLY CHRISTIAN TO MANNERISM 3 prereq 200. Early Christian and Byzantine, Middle Ages, Renaissance.

202 SURVEY OF WESTERN ART: MANNERISM TO PRESENT 3 prereq 201. Mannerism, baroque, modern world.

229 INTERMEDIATE CERAMICS 2 prereq 4 credits of 129.

233 (133) PRINTMAKING 2 R-9 prereq 9 credits of 123. Methods and techniques.

235 (135) SCULPTURE 3 R-9 prereq 9 credits of 123. Methods and techniques.

239 (139) WATERCOLOR 3, Su 2 R-6 prereq 9 credits of 123. Offered by extension for 1 credit. Watercolor techniques and expressive use of subject matter.

240 (140) PAINTING 3, Su 2 or 4, R-9 prereq 9 credits of 123 Su c/i. Variable credit by extension. Techniques of oils and related media. Individual criticism of technique and expression.

FOR UNDERGRADUATES AND GRADUATES

Courses 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 393 and 394 are offered on a 3-year cycle.

300 INTRODUCTION TO ART EDUCATION 2. Concepts, history, procedures of art education.

303-304 ELEMENTARY SCHOOL ART 3. Variable credit by extension. (303) Art education at elementary school level, philosophy, history, theories and practice in media. (304) Continued practice in media and material used in public schools.

307 METHODS OF TEACHING SECONDARY ART 3. Objectives, methods, materials, and evaluations.

315 PHOTOGRAPHY V 2-6 R-6 prereq 127. Photography as design experience; darkroom procedures; techniques.

323 (151) ADVANCED DRAWING II 2 R-6 prereq 9 credits of 123. Expressive drawing from models, anatomical constructions, and advanced drawing projects.

325 ADVANCED DESIGN V 2-6 R-6 prereq 125-126-127. Advanced problems of a specialized nature in design, photography and crafts.

326 CRAFTS DESIGN 2 prereq 127. Two dimensional experiences in textiles, leather, weaving.

327 CRAFTS DESIGN 2 prereq 127. Three dimensional experiences in wood, plastic, glass enamel.

329 (330) ADVANCED CERAMICS V 2-6 R-6 prereq 6 credits of ceramics. Advanced problems in ceramic techniques. (For art majors only.)

333 (334) ADVANCED PRINTMAKING V 2-6 R-6 prereq 6 credits of 233. Advanced work in printing media.

335 ADVANCED SCULPTURE V 2-6 R-6 prereq 9 credits of 235. Advanced problems in sculpture media.

340 ADVANCED PAINTING V 2-6 R-6 prereq 9 credits of 240. Advanced work in painting media.

380 ANCIENT NEAR EAST, GREECE 3 prereq c/i. Ancient Near East, Aegean and Greek Art.

381 HELLENISTIC TO BYZANTINE ART 3 prereq c/i.

382 ROMANESQUE, GOTHIC 3 prereq c/i.

383 EARLY RENAISSANCE 3 prereq c/i (to be offered 1967-68).

384 HIGH RENAISSANCE 3 prereq c/i (to be offered 1967-68). North and South.

385 BAROQUE AND ROCOCO ART 3 prereq c/i (to be offered 1967-68). Rubens through Fragonard.

386 EUROPEAN ART 1750-1825 3 prereq c/i.

387 EUROPEAN ART 1825-1870 3 prereq c/i.

388 EUROPEAN ART 1870-1900 3 prereq c/i.

389 MODERN EUROPEAN ART 1900-1914 3 prereq c/i.

393 AMERICAN ART—19TH CENTURY 3 prereq c/i.

394 AMERICAN ART—20TH CENTURY 3 prereq c/i (to be offered summer 1968).

395 EASTERN ART 3 R-9. Major styles and monuments of China, India, and Japan.

414 ART IN SPECIAL EDUCATION 2. Philosophy and scope of art coupled with directed activities and problems.

415 INDEPENDENT WORK IN PHOTOGRAPHY V 2-6 R-6 prereq 6 credits of 315. Advanced techniques, procedures.

423 INDEPENDENT WORK IN DRAWING 2 R-6 prereq 4 credits of 323.

425 INDEPENDENT WORK IN DESIGN V 2-6 R-15 prereq 6 credits of 325. Design, photography and crafts.

429 INDEPENDENT WORK IN CERAMICS V 2-6 R-15 prereq 6 credits of 329.

433 INDEPENDENT WORK IN PRINTMAKING V 2-6 R-15 prereq 6 credits of 333.

435 INDEPENDENT WORK IN SCULPTURE V 2-6 R-15 prereq 6 credits of 335.

440 INDEPENDENT WORK IN PAINTING V 2-6 R-15 prereq 6 credits of 340.

450 SEMINAR V 1-3 R-6 prereq 9 credits in art and c/i.

FOR GRADUATES

523 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Special advanced work in drawing.

525 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Specialized advanced work in design.

529 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Specialized advanced work in ceramics.

533 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Specialized advanced work in printmaking.

535 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Specialized advanced work in sculpture.

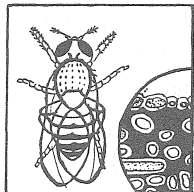
540 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Specialized advanced work in painting.

550 SPECIAL PROBLEMS V 2-6 R-30 prereq c/i. Individual research in art history or art theories.

699 THESIS AND TERMINAL PROJECT V R-15.

BIOLOGY

deals with living things. This program provides basic education in the biological sciences (botany, micro-biology, and zoology). It is intended for students who wish to work in the broad area of biology rather than in one of the specific fields, particularly for those who plan graduate work in the interdisciplinary areas of biology or the medical sciences, and for those who plan to teach biology at the secondary level.



SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN 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: 55 or more credits in Biology including Botany or Zoology 111 (Introduction to Biology), Botany 112 (General Botany), Botany 325 (Plant Physiology), Botany 437 (Cytology), Microbiology 200 (General Microbiology), Zoology 112-113 (General Zoology), Zoology or Botany 485 (Genetics), and 10 additional credits in 300 or 400 level courses in biological sciences. Zoology 330 (Cellular Physiology) recommended.

The following courses in allied sciences must be completed: Chemistry 121-122-123 (College Chemistry), Chemistry 261-262 (Organic Chemistry), Chemistry 370 (Survey of Physical Chemistry), Physics 111-112-113 (General Physics) or Physics 221-222-223 (General Physics), Math 116 (College Algebra), Math 117 (Trigonometry), and Math 118 (Introduction to Calculus).

The foreign language requirement listed earlier in the catalog must be satisfied.

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 his environment 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. A degree 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.



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 plant quarantine, 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 field require a master's or doctor's degree. For most teaching positions in colleges and universities the doctorate is essential.

Besides offering a Bachelor of Arts degree, the department also offers opportunities for graduate work (see Graduate School) leading to the Master of Arts, Master of Science

and the Doctor of Philosophy degrees in the following major areas of botany: Anatomy, Cytology, Ecology, Morphology, Mycology, Paleobotany, Physiology, Forest Pathology and Taxonomy. More detailed information can be obtained from the chairman of the department.

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

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN BOTANY. 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 Botany: 45 credits in Botany including Botany 111, 112, 113; 2 credits of 495 and at least one course from each of the following groups: (1) Morphology, 441, 442, 443, 445, 475, 483; (2) Physiology 325, 330, 421, 422, 423, 427, 433; (3) Ecology 250, 355; (4) Anatomy-Cytology 433, 435, 437; (5) Taxonomy 265, 365, 366, 368, 467; and (6) Genetics, 485, 486.

Also required are: Zool. 112, 113; Mathematics 118; Microbiology 200; Chemistry 160 or 261; Physics 111-112-113 or 221, 222, 223. Recommended electives: Geography 360, Geology 110; Chem. 481, 482; and a course in statistics. The foreign language requirement listed in the catalog must be satisfied: French or German preferred.

Courses 265, 355, 365, 370, 375, 441, 555 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.

Suggested first year program:

	Quarter			S
	A	W		
Botany 111, 112, 113	5	5		5
Chemistry 101, 102, 160 or 121, 122, 123	4(5)	4(5)		5
Mathematics 116, 117	5	5		
English 150				3
Health & PE 100	1	1		1
	15(16)	15(16)		14

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

100 FIELD BOTANY 3 (0-6). The collection, preservation and identification of plants and consideration of where they grow. Given only as an extension course. Credit not allowed toward degree in Botany.

111 INTRODUCTION TO BIOLOGY 5 (3-4). Introduction to the 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 this course and Zool 111.

112 (122) GENERAL BOTANY 5 (3-4) prereq 111 or =. An introduction to the anatomy, physiology and ecology of higher plants.

113 GENERAL BOTANY 5 (3-4) prereq 112 or =. A survey of the morphology, reproduction and evolutionary relationships of the various plant groups.

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

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

265 (123) LOCAL FLORA 4 (2-6) prereq 112. An introduction to the identification of flowering plants.

FOR UNDERGRADUATES AND GRADUATES

325 (225) PLANT PHYSIOLOGY 5 (3-4) prereq 112 and Chem 160 or 123. An introduction to the chemical and physical basis of metabolism, photosynthesis, nutrition, water relationships and growth of plants.

330 CELLULAR PHYSIOLOGY (see Zoology)

334 MICROTECHNIQUE 3 (1-4) prereq 15 cr. in Botany. Techniques of preparing cleared whole mounts, cytological squashes, woody and non-woody celloidin mounts; maceration of wood; use of freezing, sliding and rotary microtomes.

355 PRINCIPLES OF PLANT ECOLOGY 5 (3-4) prereq 250, 251 and 325. Plants and plant communities in relation to their physical and biotic environment.

365 SYSTEMATIC BOTANY 5 (2-8) prereq 113 or =. The identification, principles of classification, phylogeny, methods of collecting and preserving of vascular plants. (Credit not given for both 265 and 365. Given for 6 cr. at the Biological Station.)

366 AGROSTOLOGY 5 (2-6) prereq 265 or =. Identification, classification, and ecological relationships of grasses, sedges, and rushes. (Given for 3 cr at the Biological Station.)

368 AQUATIC FLOWERING PLANTS 3 (0-7) prereq 265 or =. Identification, classification and ecological distribution of the higher aquatic plants.

24—BOTANY

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 361 and For. 390).

403 BIOLOGICAL ILLUSTRATIONS 2 (0-4) prereq 1 year of biology and c/i. Introduction to the basic principles and skills of producing illustrative materials relevant to the biological sciences. (\$25 special supplies fee. Credit not allowed for this course and Zool 403).

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

422 PHYSIOLOGY OF PLANT WATER RELATIONS 5 (3-4) o/y prereq 325. Water metabolism in plants, plant-soil relationships with emphasis on experimental techniques.

423 (325) RESPIRATORY METABOLISM IN PLANTS 5 (3-4) o/y prereq 325, Chem 262 and Phys 113 or =. The respiratory mechanism in plants, relationships of respiration to other processes in the plant, photosynthesis, nitrogen metabolism.

427 PLANT VIRUSES 4 (2-4) prereq 112 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 325, 441 or c/i. Comparative macro- and ultrastructure, physiology, biochemistry, and ecology 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 325 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant physiology not taken up in regular courses.

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

434 ADVANCED MICROTÉCHNIQUE 4 (1-6) prereq 20 cr in Botany or c/i. Training in techniques such as photomicrography, photography, audio-radiography, in vitro culture, etc.

435 (335) PLANT ANATOMY 5 (2-6) o/y, prereq 113 or =. The origin of organs and tissues and the anatomy of vascular plants.

437 (337) CYTOLOGY 5 (3-4) e/y prereq 113 and Chem 160 or =. The finer structures of the plant cell in relation to its functions.

439 (339) PROBLEMS IN PLANT ANATOMY AND CYTOLOGY 1-6 (0-3/cr) R-6 prereq 435, 436 or 437 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant anatomy and cytology not taken up in regular courses.

441 (361) PHYCOLOGY 5 (2-6) e/y prereq 113 or =. Morphology, taxonomy and ecology of the algae, especially of the Northern Rocky Mountains (given for 6 credits at the Biological Station).

442 (363) BRYOLOGY 5 (2-6) o/y prereq 113 or =. The morphology, taxonomy and ecology of the bryophytes, especially of the Northern Rocky Mountains (given for 3 cr at the Biological Station).

443 PTERIDOLOGY 5 (2-6) o/y prereq 113 or =. The morphology, taxonomy and ecology of the pteridophytes, especially of the Northern Rocky Mountains (given for 3 credits at the Biological Station).

445 (345) SPERMATOPHYTES 5 (2-6) e/y prereq 113 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 443 or 445 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant morphology not taken up in regular courses.

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

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

469 (369) PROBLEMS IN PLANT TAXONOMY V 1-6 (0-3/cr) R-6 prereq 265 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of plant taxonomy not taken up in regular courses.

475 (375) MYCOLOGY 5 (3-4) o/y prereq 113 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 370 or 475 and c/i. Individual or group work consisting of research problems, special readings or discussions dealing with aspects of mycology and plant pathology not taken up in regular courses.

483 PALEOBOTANY 5 (3-4) o/y prereq 113 or =. An introduction to the study of fossil plants.

485 (385) GENETICS. (See Zoology.)

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

490 SEMINAR IN BIOLOGY 1 (2-0). Special problems in Biology. (Credit not allowed for this course and Zool. 490).

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

495 BOTANICAL LITERATURE 1 (2-0) R-3 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.)

522 BSCS BIOLOGY 6 prereq Bachelor's degree: major preparation in Biology, at least 2 years' teaching experience in Biology at the secondary level. Basic concepts of biological ecology as applied to the use of American Institute of Biological Sciences, Biological Sciences Curriculum Study (BSCS) Green-Version materials in teaching high school biology. Not to be allowed for a major in Botany.

523 PHOTOBIOLOGY 4 (2-4) prereq 330. The interaction between non-ionizing radiation and biological systems including photosynthesis, vision, photoperiodism, bioluminescence; methods for studying effects of light on plants, animals, and microorganisms. (Credit not allowed for this course and 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 (6-15) prereq Bachelor's degree: major preparation in Botany, Biology, or Zoology. Community concepts including succession, stratification, periodicity and energy relationships; introduction to population problems. Offered at the Biological Station. (Credit not allowed for this course and Zool 551.)

555 ADVANCED PLANT ECOLOGY 4 (2-4) e/y prereq 355, Math 125 or =. Field and laboratory analysis of theories and methods used in the description and interpretation of plant and environmental relationships.

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

564 EXPERIMENTAL TAXONOMY 4 (2-4) e/y prereq 437, 486, 563. Modern concepts in taxonomy with emphasis on cytological, chemotaxonomic and other modern approaches to the problems of plant classification.

565 (465) PHYTOGEOGRAPHY 4 (4-0) e/y prereq 355, 486, 562, 563, Geol 101-102 or 110. Vegetation types of the world and their history in North America.

571 ADVANCED FOREST PATHOLOGY 3 (2-2) e/y prereq 370 or 475. Mycorrhizal, rust and defoliating fungi and dwarf mistletoes of the forest.

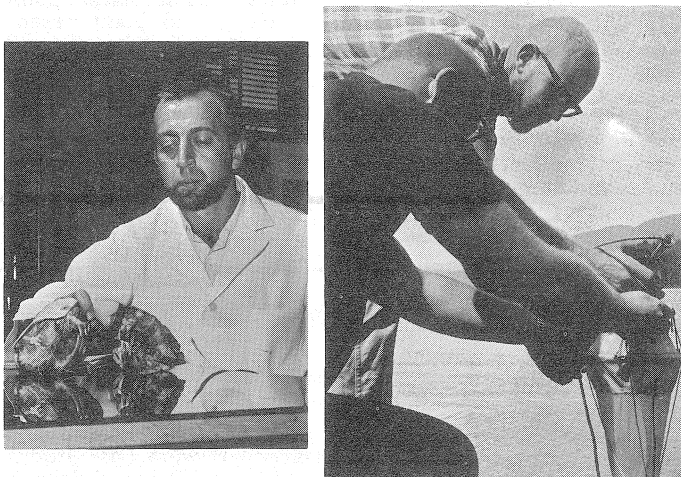
591 GRADUATE SEMINAR 1 (2-0) prereq graduate standing in biological sciences.

600 RESEARCH V (0-3/cr) R-15.

699 THESIS V R-15.

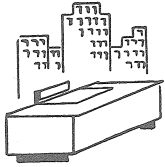
COURSES OFFERED AT THE BIOLOGICAL STATION

Many of the courses listed are offered during the summer session at the Biological Station on Flathead Lake. In the past, these have traditionally been Bot 365, 366, 368, 403, 441, 442, 449, 469, 475, 490, 549, 551, 569, 600, 699.



BUSINESS ADMINISTRATION

The School of Business Administration, founded in 1914, 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, general business, marketing, office administration, personnel or production management, and real estate.

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

Opportunity for further study at the graduate level is offered through two programs leading to the degrees of Master of Business Administration or Master of Science in Business Administration (with concentrations in accounting, business education, computer systems, finance, management, or marketing). The MBA program is particularly suited to those students 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 toward meeting the general university requirements and prerequisite course work for courses to be taken subsequently in the School of Business Administration.

The general university and pre-business administration requirements include: Health and Physical Education 100 (6 quarters, 6 credits), English 150, 250 and English 350 (taken in the junior or senior year); requirements from Group I; requirements from Group II including Mathematics 116; requirements from Group III including Economics 201-202-203; requirements from Group IV; Speech 111 or 112; Business Administration 201-202 and 250. Pre-business requirements are prerequisites for all business administration courses numbered 300 and above.

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.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

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

- Complete the general university and pre-business administration requirements.
- Complete core courses: Economics 301, Bus Ad 322, 340, 342, 350, 357-358, 360, 370, and 446.
- Select before the beginning of the third quarter of the junior year an area of concentration from the following: Accounting, Business Education, Finance, General Business, Management—Option A or Option B, Marketing, 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 School of Business Administration and by filing the completed form in that office.

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

e. Offer not less than a total of 75 credits in courses in the School of Business Administration. Courses outside the School of Business Administration which may count toward the 75 credit requirement are: all courses offered by the Department of Economics; English 450; History 473, 474; and courses listed in the curricula of the areas of concentration.

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 180 credits plus 6 credits in Health and Physical Education.

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

CURRICULA OF THE AREAS OF CONCENTRATION ACCOUNTING

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

	cr.
Bus. Ad. 203—Elementary Accounting	3
Bus. Ad. 303-304—Cost Accounting	6
Bus. Ad. 306-307—Intermediate Accounting	8
Bus. Ad. 401-402—Income Tax	6
Bus. Ad. 409—Advanced Accounting	3
Bus. Ad. 412—Accounting Theory	3

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

	cr.
Bus. Ad. 305—Governmental Accounting	2
Bus. Ad. 370—Electronic Information Processing	3
Bus. Ad. 403-404—Auditing	6
Bus. Ad. 410—Advanced Accounting	3
Bus. Ad. 418—C.P.A. Review	5
	19

BUSINESS EDUCATION

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

	cr.
Bus. Ad. 183—Advanced Typewriting	2
Bus. Ad. 184-185-186—Stenography	15
Bus. Ad. 193—Beginning Secretarial Practice	2
Bus. Ad. 194—Records Management	2
Bus. Ad. 203—Elementary Accounting	3
Bus. Ad. 292—Office Machines Practice	2
Bus. Ad. 380—Methods of Teaching Typewriting	2
Bus. Ad. 381—Methods of Teaching Bookkeeping and Basic Business	2
Bus. Ad. 383—Office Management	3
Bus. Ad. 384—Methods of Teaching Shorthand and Transcription	2
	35

*Business Education students are not required to take Speech 111 or 112, Bus Ad 322, 340, 342, 350, 370, or 446.

FINANCE

This program is designed to give a broad understanding of the role of finance in our economy including private and public financial institutions, money, credit, and security markets and the technical training necessary in preparation for managerial positions in financial work in large and small scale business.

	cr.
Bus. Ad. 330—Principles of Insurance	3
Bus. Ad. 420—Investments	3
Bus. Ad. 421—Analysis and Forecasting of Business Conditions	3
Bus. Ad. 423—Analysis of Financial Problems	4
Bus. Ad. 439—Finance Seminar	2
*Econ. 311—Intermediate Economic Analysis	4
*Bus. Ad. 347—Managerial Economics	4
	23

*Students are advised to take Econ 311 before Bus Ad 347.

GENERAL BUSINESS

This curriculum is designed to give broad training in the field of business. Requirements for a concentration in General Business are:

26—BUSINESS ADMINISTRATION

Bus. Ad. 301—Administrative Accounting	cr.	4
Bus. Ad. 347—Managerial Economics		4
Bus. Ad. 363—Analysis of Marketing Communication		3
or		
Bus. Ad. 460—Marketing Management I		3
Bus. Ad. 421—Analysis and Forecasting of Business Conditions		3
Bus. Ad. 441—Personnel Management		4
Bus. Ad. 444—Regulation of Industry		4
		<hr/> 22

MANAGEMENT

Two optional areas of concentration are offered in the field of Management:

Option A. Industrial Organization and Management (Production)

Bus. Ad. 301—Administrative Accounting	cr.	4
Bus. Ad. 441—Personnel Management		4
Bus. Ad. 442—Personnel Management		4
or		
Bus. Ad. 421—Analysis and Forecasting of Business Conditions		3
Bus. Ad. 444—Regulation of Industry		4
Econ. 321—Labor Economics	}	Any two 6
or		
Econ. 322—Labor Economics		
or		
Econ. 324—Industrial Relations		
		<hr/> 21-22

Option B. Personnel Management and Human Relations

Bus. Ad. 301—Administrative Accounting	cr.	4
Bus. Ad. 441-442—Personnel Management		8
Bus. Ad. 444—Regulation of Industry		4
Psych. 342—Personnel Psychology		3
Econ. 321—Labor Economics	}	Any two 6
or		
Econ. 322—Labor Economics		
or		
Econ. 324—Industrial Relations		
		<hr/> 25

MARKETING

The curriculum in Marketing is designed to equip the student with those analytical skills that will enable him to assume managerial roles in retailing, wholesaling, advertising, marketing research, sales, and sales administration.

Bus. Ad. 301—Administrative Accounting	cr.	4
Bus. Ad. 362—Analysis of Consumer Behavior		3
Bus. Ad. 363—Analysis of Marketing Communication		3
Bus. Ad. 460-461—Marketing Management I, II		6
Bus. Ad. 462—Pricing Policies and Practices		4
Bus. Ad. 466—Marketing Research		3
Engl. 450—Problems in Composition		3
		<hr/> 26

OFFICE ADMINISTRATION

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

Bus. Ad. 183—Advanced Typewriting	cr.	2
Bus. Ad. 184-185-186—Stenography		15
Bus. Ad. 187-188—Advanced Stenography		10
Bus. Ad. 190-191—Advanced Shorthand Transcription		2
Bus. Ad. 193—Beginning Secretarial Practice		2
Bus. Ad. 194—Records Management		2
Bus. Ad. 203—Elementary Accounting		3
Bus. Ad. 292—Office Machines Practice		2
Bus. Ad. 382—Advanced Secretarial Practice		5
Bus. Ad. 383—Office Management		3
Engl. 450—Problems in Composition		3
		<hr/> 49

*Office Administration students are not required to take Speech 111 or 112, Bus. Ad. 322, 340, 342, 350, 370, or 446.

REAL ESTATE

The curriculum in Real Estate is designed to equip the student with the basic understandings necessary for application in the real estate industry.

Bus. Ad. 324—Real Estate Law	cr.	3
Bus. Ad. 424—Money and Capital Markets		3
Bus. Ad. 425—Real Estate Finance		3
Bus. Ad. 427—Property Management		3
Econ. 385—Land Economics		3
Econ. 387—Property Valuation Theory		3
Soc. 587-588-589—Seminar in Urban Studies (any one of the three)		3
		<hr/> 21

BACHELOR 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 general university foreign language requirement.

ACCOUNTING

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

201 ACCOUNTING PRINCIPLES 3. The basic concepts and principles of accounting for accounting and non-accounting majors. Emphasis on the usefulness of accounting data as a management tool.

202 ACCOUNTING PRINCIPLES 3 prereq 201. Continuation of 201.

203 ELEMENTARY ACCOUNTING 3 prereq 202. Application of elementary accounting principles, including the mechanics and procedures required to classify, record and report accounting data. For accounting and non-accounting majors who wish additional training in basic techniques.

FOR UNDERGRADUATES AND GRADUATES

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

301 ADMINISTRATIVE ACCOUNTING 4 prereq 202. Open only to non-accounting majors. The significance of accounting data without involvement in mechanical techniques: interpretation of financial statements, internal control, budgeting, costing of products manufactured and sold, and accounting reports for administrative control. (Credit not allowed for both Bus Ad 301 and 303-304.)

303 COST ACCOUNTING 3 prereq 203. The methods of accumulating material, labor and manufacturing costs; the development of specific cost systems applicable to various types of production situations, e.g., job order, process and standard cost systems. The use of cost information in relation to managerial activities, which includes reports to management, budget preparation, break-even analysis, and cost-volume profit relationship. (Credit not allowed for both Bus Ad 301 and 303-304.)

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

305 GOVERNMENTAL ACCOUNTING 2 prereq 203. Accounting principles and problems as applied to state and local governments and other public institutions.

306 INTERMEDIATE ACCOUNTING 4 prereq 203. The fundamentals of valuation as applied to the balance sheet, and income determination as related to the operating statement. Problems involving the application of the above theories.

307 INTERMEDIATE ACCOUNTING 4 prereq 306. Continuation of 306.

401 INCOME TAX 3 prereq 202. The accounting aspects of the federal income tax law. The tax statutes as applied to individuals with problems that emphasize the filing of individual returns.

402 INCOME TAX 3 prereq 401. Corporate and partnership returns, special problems of federal, estate and gift taxes. Federal and state tax research.

403 AUDITING 3 prereq 307. The general scope and purpose of auditing, encompassing generally accepted auditing standards and procedures, the audit program, and analysis of internal control. Procedures for verifying the reliability of balance sheet and operating accounts; preparation of audit working papers, reports, and submission of the auditor's opinion.

404 AUDITING 3 prereq 403. Continuation of 403.

409 ADVANCED ACCOUNTING 3 prereq 307. Problems of partnerships, installment sales, consignments, branch accounting, receivership accounting, accounting for estates and trusts.

410 ADVANCED ACCOUNTING 3. The theory and preparation of consolidated statements.

412 ACCOUNTING THEORY 3 prereq 307. A critical examination of accounting postulates and principles underlying current accounting procedures, with emphasis on the problem of valuation as it relates to the measurement of periodic income. Readings in current accounting literature.

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.

418 C.P.A. REVIEW 5 prereq 304, 404, 409, 410. Primarily for students preparing to take the examinations for the certificate of Certified Public Accountant. Comprehensive review of questions and problems in practice, theory, and auditing given by the American Institute of Certified Public Accountants.

FOR GRADUATES

503 CONTEMPORARY ACCOUNTING THOUGHT AND PRACTICE 3 prereq 410 and approval of the graduate committee. Modern accounting theory and practice. The development of accounting thought since 1900 and the social significance.

504 THEORY OF INCOME DETERMINATION 3 prereq 410 and approval of the graduate committee. The theories underlying the accounting calculation and disclosure of periodic net income. Economic, legal and tax concepts of income.

505 MANAGERIAL ACCOUNTING 3. Principles, theories and procedures of recording transactions for the development and interpretation of accounting reports. Recording techniques for data accumulation with emphasis on concepts leading to the uses of financial statements in decision making.

506 MANAGERIAL ACCOUNTING 3 prereq 505. The significance and usefulness of accounting data in relation to managerial activities. Concepts and procedures for presentation of data for managerial and financial decisions. Income determination, cost analysis, cash flow, and analytical reports. Interpretation, use, and limitations of accounting reports.

599 RESEARCH V R-6. Special research problems.

605 ADMINISTRATIVE ACCOUNTING CONTROLS 3. The use of accounting information for business decision making and the responsibility of the controller in providing an effective information system for over-all financial planning and control. Concentration on complex control problems, including relevant costing, capital budgeting, transfer-pricing and return on investment as a measure of profitability.

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.

FINANCE

FOR UNDERGRADUATES

329 PERSONAL INVESTMENTS 2. Savings accounts, purchasing a home, purchasing insurance, securities, investment trusts. The basic facts with which a layman should be acquainted. (Not open to Business Administration majors. Available as cognate graduate credit for Education degrees.)

FOR UNDERGRADUATES AND GRADUATES

322 BUSINESS FINANCE 3 prereq all pre-business requirements. Forms of business organization; financial aspects of promotion and organization; sources of financing and the administration of income; failure and reorganization. (Graduate credit available for non-business majors only.)

323 COMMERCIAL BANKING 4 prereq Econ 301. Liquidity, loan and investment policy, credit analysis, loan administration, interbank borrowing, bank operating costs, bank earnings, and relations with customers, government, and the public.

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.

330 PRINCIPLES OF INSURANCE 3 prereq Econ 203. Basic risk analysis; introduction to fire, casualty, life and health coverages; business and personal insurance needs; company organizations and industry practices; the liability peril; automobile insurance laws; claims procedure; government regulation. (Graduate credit available for non-business majors only.)

331 LIFE AND HEALTH INSURANCE 3 prereq 330. Analysis of individual and group contracts; human life values and insurance needs; estate planning and the impact of taxation; business continuation agreements and insurance; pensions and annuities for business and individual retirement programs.

332 PROPERTY AND CASUALTY INSURANCE 3 prereq 330. Concentrated analysis of coverages; insurance management problems facing specific types of business and personal risks; multiple-line policies; legal interpretation and analysis; practical case problems in liability and direct loss situations.

420 INVESTMENTS 3 prereq Econ 301. Selection of risk assets, and evaluating the income and capital returns associated with alternative investment opportunities under conditions of uncertainty.

421 ANALYSIS AND FORECASTING OF BUSINESS CONDITIONS 3 prereq Econ 301. Investigation of determinants of overall business conditions as background for business and investment decisions, analysis of proposals for controlling business fluctuations and evaluation of forecasting techniques.

423 ANALYSIS OF FINANCIAL PROBLEMS 4 prereq 322. Problems of asset management, financing, and capital budgeting, and current problems of financial management created by changing economic conditions through case analysis.

424 MONEY AND CAPITAL MARKETS 3 prereq Econ 301. Developments in and appraisals of money and capital markets and their impact on financial decisions and interrelationships among sections of the economy associated with monetary and fiscal policy.

425 REAL ESTATE FINANCE 3 prereq 322, 424. Sources and availability of funds, lending agencies, the primary and secondary mortgage markets, nature and extent of government participation in real estate finance, types of primary and secondary financing devices, and financing instruments.

427 PROPERTY MANAGEMENT 3 prereq 324. Management principles; feasibility of commercial, industrial or residential properties; acquisition, promotion, development and physical maintenance of properties; owner, tenant and personnel relations; accounting and records; and creative management.

439 FINANCE SEMINAR 2 prereq senior standing. Selected topics in finance with emphasis on individual study and research.

499 SEMINAR V R-4.

FOR GRADUATES

522 SECURITY ANALYSIS 3 prereq 521. Principles and techniques. Technical preparation for security analysis work with financial organizations (banks, insurance companies, trust institutions, investment companies, investment banking firms, security dealers and brokers, and others).

523 FINANCIAL MANAGEMENT 3 prereq Econ 510-511-512. A study of financial problems of corporate enterprise involving the planning, procuring, and controlling of financial resources. The theoretical and practical aspects of financial management from the point of view of the individual business unit are analyzed together with specific problems that arise out of changes in corporate structures and financial markets.

599 RESEARCH V R-6. Special research problems.

681 PROBLEMS IN FINANCIAL MANAGEMENT 3. Internal and external aspects of business finance as viewed by the financial manager, resource allocation in relation to the investment and financing process, theory and techniques applicable to capital budgeting and the cost of capital, the impact of economic environment on financing and investment decisions.

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.

MANAGEMENT

FOR UNDERGRADUATES

250 INTRODUCTORY BUSINESS STATISTICS 4 prereq Math 116. Methods of collection, analysis, and presentation of economic, social, and business data. Ratios, frequency distributions, averages, variability, sampling error, and measures of association.

341 INDUSTRIAL PURCHASING AND TRAFFIC MANAGEMENT 4 prereq 340, 360. Current practice 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 theory of law as related to business environment. What law is, sources and classifications of law, judicial system and legal procedures for resolving conflicts, 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, sales, 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, suretyship, secured transactions, creditor's right, trusts and estates, wills and intestacy. (Primarily for accounting majors intending to take the CPA examinations, but open to all students.)

371 INTRODUCTION TO COBOL PROGRAMMING 2 prereq Math 001 or =. Primarily for students in Business or Economics. Computer programs will be developed and written by students. (Credit not allowed for both Bus Ad 371 and CS 102.)

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. (Graduate credit available for non-business majors only.)

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. (Graduate credit available for non-business majors only.)

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

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

350 QUANTITATIVE MODELS FOR GUIDING BUSINESS DECISIONS 3 prereq all pre-business requirements. Formulation and analysis of quantitative models for guiding business decisions. Certainty and uncertainty models such as statistical inference, regression, correlation, and linear 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.

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. (Graduate credit available for nonbusiness majors only.)

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 301. Economic concentration and maintaining competition. Changing relationships between government and industry emphasizing regulatory legislation, administrative agencies, national policies and social control.

446 ADMINISTRATION AND BUSINESS POLICIES 4 prereq 340, 360, and Econ 301. (May only be taken in one of last two quarters before graduation.) Top-management oriented to develop an integrated view of the organic specializations. Practice in analytical tools involved in problem solving and in coordination.

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

459 QUANTITATIVE PROBLEMS ANALYSIS V R-6 prereq 350 or = or c/i. Practice in the application of selected quantitative techniques to business problems. Topics and projects selected in consultation with the instructor.

470 ANALYSIS AND DESIGN OF BUSINESS SYSTEMS 3 prereq 347, 350, 370, and CS 200 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 practical problems encountered in defining business systems and judging the feasibility of computer processing.

475 COMPUTER SIMULATION OF BUSINESS SYSTEMS 3 prereq 350 or = and CS 200 or =. Modeling business information and control systems for simulation on electronic computers. Applications 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 social psychology.

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

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

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

557 LEGAL ENVIRONMENT 3. Includes classification of the law, the judicial process, the attorney-client relationship, available remedies, settlement of 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.)

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 of the organization; appraisal and adjustments of the organization to changes in environment.

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

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

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 development. Analysis of education's relationship to scientific progress, technological development, innovation and the socio-managerial implications of automation.

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

690-691-692 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

360 MARKETING 3. prereq all pre-business requirements. Product policy, channels of distribution, merchandising, marketing institutions, marketing functions, pricing, government regulation. (Graduate credit available for non-business majors only.)

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

362 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.

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

368 INTERNATIONAL MARKETING 4 prereq 360 (prereq waived for 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 460. Individual and class analysis of case studies in marketing management.

462 PRICING POLICIES AND PRACTICES 4 prereq 461. The roles of pricing strategy and competition in marketing decision making. Administrative marketing problems related to elasticity of demand, cost curves, marginal analysis and competitive price behavior. Marketing policies and strategies as they relate to competition.

466 MARKETING RESEARCH 3 prereq 362, 363. Research techniques and methods including statistical analysis, quantitative experimentation, and simulation. Survey of current research practices in marketing and participation in class field project.

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

499 SEMINAR V R-4.

FOR GRADUATES

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 2. Spoken communication in the organizational setting; theories, principles and techniques 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 180-181-182, 183, 184-185-186, 187, 188-189, and 190-191 may be applied toward graduation by students not majoring in Business Administration or earning a teaching major or minor in Business Administration. To register for any course in stenography or secretarial practice a student must have passed the English entrance examination, completed English 150 or its equivalent, or be concurrently registered in English 150.

FOR UNDERGRADUATES

180-181-182 ELEMENTARY TYPEWRITING 2 prereq placement for 181-182. Development of basic skills. With 1 H.S. entrance unit, no credit in 180; 2 units, no credit 180, 181.

183 ADVANCED TYPEWRITING 2 prereq 182 or placement. Application of basic skills to production jobs.

184-185-186 STENOGRAPHY 5. Theory, dictation, transcription. With 1 H.S. entrance unit, no credit in 184; 2 units, no credit 184, 185.

187-188-189 ADVANCED STENOGRAPHY 5 prereq 187: 186 or placement; 188: 187 and 190 or placement; 189: 188 and 191 or placement. Review, speed development, Civil Service and State Merit tests. Concurrent enrollment in 190-191.

190-191 ADVANCED SHORTHAND TRANSCRIPTION 1 prereq 186 or placement. Concurrent enrollment in 187-188 required.

193 BEGINNING SECRETARIAL PRACTICE 2 prereq 182. Duplicating, dictating and transcribing machines.

194 RECORDS MANAGEMENT 2 prereq 182 and c/i. Alphabetic, Numeric, Automatic, Geographic, Subject, Decimal, and Soundex filing.

292 OFFICE MACHINES PRACTICE 2. Calculators and Adding.

FOR UNDERGRADUATES AND GRADUATES

380 METHODS OF TEACHING TYPEWRITING 2 prereq 183 or teaching experience in business subjects. Required of teaching majors and minors in Business Administration.

381 METHODS OF TEACHING BOOKKEEPING AND BASIC BUSINESS 2 prereq 201 or teaching experience in business subjects. Required of teaching majors and minors in Business Administration.

382 ADVANCED SECRETARIAL PRACTICE 5 a/y prereq 183, 187, 190, 193, 194, 292; Engl 450; or c/i. Practical application to typical secretarial activities. Required for office administration majors.

383 OFFICE MANAGEMENT 3. Principles of scientific office management.

384 METHODS OF TEACHING SHORTHAND AND TRANSCRIPTION 2 prereq 186 or teaching experience in business subjects. Required of teaching majors and minors in Business Administration.

385 PHILOSOPHY OF VOCATIONAL BUSINESS EDUCATION 3. Major issues and forces affecting the development of vocational and technical business education; theories and practices relative to organization, operation and evaluation of vocational and technical business education programs; historical development of vocational education; and the relationships of vocational education to practical arts and general education.

386 PRACTICES IN VOCATIONAL BUSINESS EDUCATION 3. Teaching techniques for various units of instruction; the development of materials for class use, development of units of study, the organization of student clubs, equipment, and curriculum.

387 COOPERATIVE VOCATIONAL BUSINESS EDUCATION PROGRAMS 3. The organization and operation of vocational business education programs in the high school and post-secondary levels. Determining local needs, curriculum development, coordination techniques, and evaluation.

499 SEMINAR V R-4.

FOR GRADUATES

580 IMPROVEMENT OF INSTRUCTION IN OFFICE MACHINES PRACTICE 3 prereq 183 or business teaching experience and c/i. Lecture, methods, and rotation-plan techniques in teaching newest office machines.

581 IMPROVEMENT OF INSTRUCTION IN SECRETARIAL PRACTICE 2 prereq 183 or business teaching experience and c/i. Lecture, methods, and rotation-plan techniques in teaching secretarial machines. Duplication processes in producing the high school newspaper.

582 PROBLEMS IN TEACHING BOOKKEEPING 3 prereq 201 or bookkeeping teaching experience and c/i. Developing a course of study using the latest methods and materials.

583 PROBLEMS IN TEACHING SHORTHAND AND TRANSCRIPTION 3 prereq 186 or shorthand teaching experience and c/i. Developing a course of study using the latest methods and materials.

584 PROBLEMS IN TEACHING TYPEWRITING 3 prereq 183 or typewriting teaching experience and c/i. Developing a course of study using the latest methods and materials.

585 UNIT COURSES IN BUSINESS EDUCATION V R-10 pre-req major or minor in Bus. Ad. or business teaching experience and c/i. Several units may be taken in one or more summers. Each unit will carry a specific designation of topic covered.

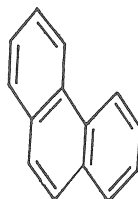
599 RESEARCH V R-6. Special research problems.

697 PROFESSIONAL PAPER V R-5. Based on primary or secondary research. Subject matter in the area of the student's major interest must be approved by graduate adviser.

699 THESIS V R-9.

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. The M.S., M.S. for Teachers of Chemistry, M.S. in Biochemistry and Ph.D. degrees are also offered. (See Graduate School)

A departmental honors program has been established for chemistry majors who have attained a high scholastic record through their first two years. This program is based upon independent study and research under the direction of individual faculty members. In many cases financial support is available on a part-time research assistantship basis from research grants obtained by individual faculty members.

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

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs algebra, geometry and trigonometry. It is desirable that the student complete two years of Algebra, Chemistry, German or French.

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 180 credits excluding Phys. Ed. and basic R.O.T.C., 70 Chemistry credits including Chem 121-122-123, 245, 265-266-267, 371-372-373, 375-376-377, 431-432-433, 446, 452, 453, 466, and 6 credits selected from Chem 455, 463, 464, 474, 490, graduate courses in Chemistry with the consent of the department, Geol 427, Geol 428, Geol 445, Geol 528, and advanced courses in Mathematics or Physics. (Chemistry courses 455 and 490 may not be used to satisfy all of these 6 elective credits.) At the time of graduation a major in Chemistry must have acquired a reading knowledge of German or five quarters of German. College Physics and Mathematics through 251, and Mathematics 252 or 253, are required. Every student, except those 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 466, 6 credits of advanced Chemistry, Chem 453, Mathematics 252 or 253. (See also Pre-Med Sciences option.)

30—CHEMISTRY

CHEMISTRY CURRICULUM FOR THE B.S. DEGREE

Freshman Year

	Cr. A	Cr. W	Cr. S
Chem. 121-2-3	5	5	5
Math 121-151-152	5	5	5
English 150	3		
Electives	2-3	4-6	4-6
Phys. Ed. 100	1	1	1
R.O.T.C. 101-2-3 (Optional)	0-2	0	0-2
	16-19	15-17	15-19

(Beginning Math course actually dependent on placement test.)

Sophomore Year

Chem. 265-6-7	5	5	5
Math 153, 251	5	5	5
Physics 221-2-3	5	5	5
Chem. 245			5
Electives, or Engl. 250			0-5
Phys. Ed. 100	1	1	1
R.O.T.C. 201-2-3 (Optional)	2	1-2	0-2
	16-18	16-18	16-18

(Can defer Physics 223 to spring quarter Junior Year and replace by 5 cr. elective.)

Junior Year

Math 253	5		
Chem. 371-2-3	3	3	3
Chem. 375-6-7	1	1	1
German 101-2-3	5	5	5
Electives (to include Engl. 250 or 350)	2-5	5-8	5-8
	16-19	14-17	14-17

Senior Year

Chem. 431-2-3	1	1	1
German 211, 212	4	4	
Chem. 446	5		
Chem. 452		3	
Chem. 453			3
Chem. 466			3
Electives (must include 6 cr. of Advanced Chem.), Engl. 350	5-8	7-10	8-11
	15-18	15-18	15-18

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

CHEMISTRY CURRICULUM FOR THE B.A. DEGREE (PRE-MEDICAL OPTION)

Freshman Year

	A	W	S
Chem. 121-2-3	5	5	5
Math. 121, 151, 152	5	5	5
English 150	3		
Elective	2-3	4-6	4-6
Phys. Ed. (and Mil. Sci.—optional)			

(Beginning Math course actually dependent on placement test.)

Sophomore Year

Chem. 261-2-3 (or 265-6-7)	5	5	5
Zool. 111-2-3	5	5	5
Chem. 245			5
Psychology 110	5		
Electives		2-3	
Phys. Ed. (and Mil. Sci.—optional)			
Engl. 250		3	

Junior Year

Physics 221-2-3	5	5	5
For. Lang. 101, 102, 103	5	5	5
Zool. 404		5	
Electives (e.g., Zool. 304) or Engl. 350	5-8	0-3	0-3
Chem. 370			5

Senior Year

For. Lang. 211, 212	4	4	
Chem. 446	5		
Chem. 452		3	
Chem. 481, 482	5	5	
Electives or Engl. 350	0-5	3-6	15-17
(Zool. 485)	(5)		

GRADUATE WORK. See Graduate School. 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 4 (5-2). The basic laws, properties and reactions of elements and compounds. For students desiring a one year general course only.

121-122-123 COLLEGE CHEMISTRY 5 (5-4). 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 121-122.

160 SURVEY OF ORGANIC CHEMISTRY 5 (5-4). 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.

245 QUANTITATIVE ANALYSIS 5 (3-6) prereq 123. Gravimetric, volumetric and colorimetric methods of analysis; theory of error as applied to chemical analysis; introduction to analytical separation.

261-262-263 ORGANIC CHEMISTRY 5 (4-4) prereq 102 or 122. Credit not allowed for both Chem 160 and 261.

265-266-267 ORGANIC CHEMISTRY 5 (4-5) prereq 123. Designed for chemistry majors.

FOR UNDERGRADUATES AND GRADUATES

329 METHODS OF TEACHING HIGH SCHOOL CHEMISTRY 3 (2-4) prereq 123 or 328. 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.

370 SURVEY OF PHYSICAL CHEMISTRY 5 (5-4) prereq 102 or 122, 160 or 261, and 15 credits of college physics. Those portions of physical chemistry which are of special interest to prospective students of medicine.

371-372-373 PHYSICAL CHEMISTRY 3 (3-0) prereq Math 251 and Physics 222. The more important methods, results and problems of theoretical chemistry.

375-376-377 PHYSICAL CHEMISTRY LABORATORY 1 (0-4) prereq 245, and 371-372-373 or concurrent enrollment.

384 PHYSIOLOGICAL CHEMISTRY 3 (3-0) or 5 (5-4) prereq 160, 262 or 266. Chemistry and metabolism of proteins, lipids and carbohydrates; respiration; colloids.

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

391 (362) 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 1 (0-2) R-4 (433 R-2) prereq 263 or 267, and a reading knowledge of German. Presentation and discussion of current literature of chemistry. Use of the library.

446 INSTRUMENTAL ANALYSIS 5 (3-6) prereq 245, 371 and 375. Theory and practice of chemical instrumentation and instrumental analysis.

448 ADVANCED INSTRUMENTAL METHODS AND PHYSICAL MEASUREMENTS 2 (0-6) prereq 371, 372 and 446. Advanced instruction in modern electronic instrumentation.

452 INORGANIC CHEMISTRY 3 (3-0) prereq 123, 263 or 267, 371 or 370. The principles of systematic inorganic chemistry.

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

455 INORGANIC CHEMISTRY LABORATORY 2 (0-6) prereq 123, 263 or 267 and c/i. The techniques in preparation of inorganic compounds.

461 CARBOHYDRATES 3 (3-0) prereq 263 or 267, 361. Structure, reactions, derivatives and biological aspects of carbohydrate compounds.

463-464 THEORETICAL ORGANIC CHEMISTRY 3 (4-0) prereq 263.

466 ORGANIC QUALITATIVE ANALYSIS V 3-5 (2-4 to 8) prereq 263 or 267. Systematic methods of identification of pure organic compounds and mixtures; general class reactions of organic chemistry.

474 CHEMICAL THERMODYNAMICS 3 (3-0) prereq 373. The principles of thermodynamics and their application to chemical systems.

476 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 5 (4-4) prereq 262 or 266. Primarily for science majors.

490 PROBLEMS AND RESEARCH V R-10 prereq c/i. Independent library and laboratory work under the guidance of a staff member. An introduction to research methods.

FOR GRADUATES

528 CHEMICAL PRINCIPLES 5 (5-4) prereq a previous course in general chemistry or high school teaching experience in chemistry and c/i. Designed for M.S. in Teaching of Chemistry program. Credit not allowed toward bachelor's degree in chemistry. An introduction to the theoretical basis of chemistry, including atomic and molecular structure, bonding, reaction rates and equilibrium.

538 SEMINAR 1 (0-2) R-4 prereq a previous college course in chemistry or high school teaching experience in chemistry. Designed for the M.S. in Teaching of Chemistry program. Discussion of problems facing high school chemistry teachers. Current advances in chemistry or in teaching of chemistry.

549 ANALYTICAL CHEMISTRY 5 (4-6) prereq 528 or equivalent. Designed for the M.S. in Teaching of Chemistry program. Credit not allowed toward bachelor's degree in chemistry. Chemical equilibrium and its applications in qualitative, quantitative and instrumental methods.

568 STRUCTURAL ORGANIC CHEMISTRY 5 (5-4) prereq 528 or equivalent. Designed for M.S. in Teaching of Chemistry program. Credit not allowed toward bachelor's degree in chemistry. Electronic structures and bonding. Functional groups and reaction mechanisms. Laboratory includes some organic qualitative analysis.

581 ADVANCED BIOCHEMISTRY 3 (3-0) prereq 482.

582 ADVANCED BIOCHEMISTRY 3 (3-0) prereq 482.

583 METABOLIC REGULATION 3 (3-0) prereq 482.

630 SEMINAR 1 R-6.

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

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

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

655-656 PHYSICAL INORGANIC CHEMISTRY 3 (3-0) prereq 452.

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

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

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

664-665 PHYSICAL ORGANIC CHEMISTRY 3 (3-0) prereq 373, and 464 or 662.

666 STEREOCHEMISTRY 3 (3-0) prereq 663.

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

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

671 KINETICS 3 (3-0) prereq 373.

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

673 THERMODYNAMICS 3 (3-0) prereq 373.

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

675 STATISTICAL THERMODYNAMICS 3 (3-0) prereq 673.

676 MOLECULAR STRUCTURE 3 (3-0) prereq 672.

678 SPECIAL TOPICS IN PHYSICAL CHEMISTRY 3 (3-0) R prereq 673. Topic specified in class schedule.

690 RESEARCH V.

699 THESIS V R-15.

101 FORTRAN II 2 prereq Math 001. Introduction to FORTRAN programming and the coding of problems. Use of flow charts and subprograms. A terminal course for students not intending further study of computers. (Credit not allowed for this course and 200.)

102 INTRODUCTION TO COBOL PROGRAMMING 2 prereq Math 001. Primarily for students in business and economics. Computer programs will be written and developed by the students. (Credit not allowed for this course and Bus Ad 371.)

200 BASIC PROGRAMMING I 3 (3-4) prereq Math 001. Structure and use of a formal procedure language (FORTRAN). Algorithms for the solution of logical and numerical problems. (Credit not allowed for both 101 and 200.)

201 ASSEMBLY AND MACHINE LANGUAGE PROGRAMMING 3 (3-4) prereq 200 or 101 with c/i. Computer structure, the logic of computer arithmetic, machine representation of information, machine and assembly language.

202 INTERMEDIATE PROGRAMMING 3 (3-4) prereq 200 or c/i. Computer programming using a current scientifically oriented language (e.g., FORTRAN IV, ALGOL or PL (I)). Data collection and organization, processing scientific information.

271-272-273 COMPUTING AND MATHEMATICS 3 (3-4) prereq Math 001 and c/i. The elements of linear equations, inequalities, calculus logic and probability are presented with the aid of a digital computer. (271) Linear equations and inequalities, linear programming. (272) Intuitive calculus. (273) Logic and probability theory. (Credit not allowed for this course and Math 271-272-273.)

301 PROGRAMMING SYSTEMS I 3 (3-4) prereq 201. Construction of assemblers, compilers, and interpreters. Design of trace and debugging programs.

302 PROGRAMMING SYSTEMS II 3 (3-4) prereq 301. Major features of executive programs and monitor control. Input and output control, system libraries and control of digital complexes.

303 ORGANIZATION OF COMPUTER SYSTEMS 3 (3-4) prereq 202. Integration of hardware and software components to accomplish a given system design and to optimize throughput efficiency.

370 COMPUTER METHODS 4 (3-4) prereq Math 252. Computer programming and a survey of elementary numerical methods. Problems of interest to secondary school teachers. (Intended primarily for those enrolled in NSF Summer Institute. Others may enroll by special permission. Credit not allowed for this course and Math 370.)

374 APPLICATION OF DIGITAL COMPUTERS 4 (3-4) prereq Math 116, CS 101, and c/i. An introduction for the formulation and programming of problems occurring in the physical sciences, life sciences, and social sciences. Definite projects will be completed by the students. (Intended only for non-mathematics majors.)

471-472-473 NUMERICAL ANALYSIS 4 (3-4) prereq Math 253 and CS 101 for 471; CS 200 recommended; c/i for 472 and 473. Error analysis, approximation and interpolation, 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 digital computer. (Credit not allowed for this course and Math 471-472-473.)

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 art of the theater the place of theater in the societies of the past and the present. The University of Montana Drama Department offers work leading to the Bachelor of Arts in drama and the Master of Arts degree in drama.



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

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN DRAMA. In addition to the general requirements listed earlier, the following special requirements must be completed for the Bachelor of Arts degree with a major in drama: Drama 101, 121-122-123, 131-132-133, 201-202-203, 244, 311, 301-302-303, 491 (4 cr.), plus a minimum of 12 additional elective credits in Drama. All drama majors are required to enroll in Drama 200 or 300, Drama Workshop, for three years.

The following courses outside the drama department are required: Speech, 3 hrs.; English 343.

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

Senior comprehensive examinations are required for all graduating students.

COMPUTER SCIENCE

The growing utility of computers in research and education as well as the increased impact of computers on our modern society strongly implies that a knowledge of computers and their capabilities should be a part of the basic education of all students. The courses listed below are designed to give the student this knowledge as well as to prepare him for a career in a field in which there is an acute shortage of trained personnel.

100 INTRODUCTION TO COMPUTERS 1 prereq Math 001. A simplified programming language (e.g., GOTRAN or FORGO) will be used to introduce students to computers and their capabilities.

32—DRAMA

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

DRAMA MAJORS PLANNING TO TEACH in Montana secondary schools must take, in addition to their drama major, a teaching major in another area for certification purposes. They will be certified in drama as a teaching minor. If the teaching major chosen is English (highly recommended) the student should follow the English requirements in the English broad fields major listed under Education. The English electives should be met in part by English 307-308-309 and 341 (12 hours). Drama majors electing a teaching major will not be required to include Drama 301-302 or five credits of drama electives, as part of their drama degree.

In addition to the above requirements state certification requires 24 hours in education (Education 200, 204, 205, 405, 407) plus Psychology 110. See Education listings.

First year program for the B.A.:

	Quarter		
	A	W	S
Drama 101	3		
Drama 121-122-123	3	3	3
Drama 131-132-133	4	4	4
Drama 200	2	2	2
Speech			3
English 150		3	
Language (French recommended) or Electives from Groups I, II, III	5	5	5
H. & P.E. 100 (Dance or fencing)	1	1	1
	18	18	18

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 (101) **REHEARSAL AND PERFORMANCE** 1 R-6. Enter any quarter. Prereq c/i. Students engaged in any aspect of production including acting, directing, lighting, stagecraft, makeup, costumes, properties, business and publicity, are eligible for registration.

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

121-122-123 (121) **ELEMENTARY ACTING** 3. Enter any quarter. Principles of 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. Study and experience in the arts of theater according to the needs of the beginning theater student. Emphasis upon laboratory production, including all arts of the theater.

201-202-203 (261-262-263) **DRAMATIC LITERATURE** 3. Enter any quarter. Plays of various periods, including Greek and Roman, Elizabethan, French Classic, The Restoration, 19th Century, Modern European, Modern American. Emphasis upon studying the performed play.

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

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

FOR UNDERGRADUTES AND GRADUATES

300 (394) **WORKSHOP IN THEATER** V 2-10 R-20 prereq previous work in theater or drama courses and consent of chairman. Study and experience in the arts of the theater according to the needs, preparation, and desires of the students; costumes, make-up, lighting stagecraft, backstage organization, stage design, acting, directing, rehearsal and performance, business, and house organization and management.

301-302-303 **HISTORY OF THE THEATER** 3. Enter any quarter. (301) World Theater to 1660. (302) World Theater 1660-1850. (303) World Theater 1850 to the present.

306 **PLAYWRITING** 2 R-6 prereq c/i. Techniques and practice in writing short and full length plays.

307-308-309 **THE DRAMA** (see English)

311-312-313 (223, 422) **DIRECTING** 4. Elements of directing the play. Direction techniques in farce, comedy, melodrama, tragedy, musical comedy and opera. Laboratory directing assignments in conjunction with the Theater and Opera Workshops.

321-322-323 (351) **ADVANCED ACTING** 3 prereq 221-222-223 or c/i. Historic and contemporary styles of acting.

329 (342) **ACTING 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.

335-336 (343) **STAGE LIGHTING** 3 prereq 131. Principles and practice in stage lighting. Theatrical lighting equipment, instruments and their use. Students will work on lighting for major productions.

341-342-343 (341) **STAGE COSTUMING** 3. Costuming theory and practice; the history of costume; the design and construction of costumes.

351-352-353 (352) **DRAMATIC INTERPRETATION** 3 prereq 3 hrs. of any voice course. Theory and practice of oral interpretation of dramatic literature, including Reader's theater.

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

374 **THEATER FOR CHILDREN** 3 prereq c/i. History and objectives of the theater for the child audience; survey of existing professional and community children's theater programs. Techniques of acting, directing, and producing plays for children to be shown before child audiences in the community.

377 (364) **CREATIVE DRAMATICS** 3 prereq c/i. Children's literature suitable for adaptation to dramatic form; improvisational and other playmaking techniques; the dramatic method in teaching non-theater subjects, demonstrations and exercise with laboratory groups of children from the community.

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 chairman. 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 modern lighting 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/i. Principles and techniques of creating make-ups for characters from dramatic literature. Students will work on make-up for major production.

491-492-493 (401-402-403) **THEATER PROJECTS** V 2-4 prereq 10 credits in drama courses or in English 307-308-309, 341-342-343, and demonstrated ability in theater and drama; to others with c/i on basis of much work in drama and the theater. Independent work in design, lighting, costume design, direction, playwriting, study of drama.

499 (491) **SEMINAR** 2 R-6 prereq 10 credits in drama courses or in Engl 307-308-309, 341-342-343, and c/i. Intensive study of dramatic theory relating to acting, directing, design, and dramaturgy.

FOR GRADUATES

501 **STUDIES IN DRAMATIC LITERATURE** 2 R-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 and dialogue as used in the play form.

511 (522) **SPECIAL PROBLEMS IN DIRECTION** 2-4 prereq 422. 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/i. Administrative and organizational techniques in the operation of theater producing organizations.

531 (511) **TECHNICAL DIRECTION** V 2-4 R-8 prereq strong technical background. Includes areas such as purchasing, scheduling, 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 321. 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



ECONOMICS

is that branch of the social sciences which deals with man's efforts to satisfy his wants by utilizing the scarce means provided by nature. The department considers its teaching goals to be three fold: (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, public finance and taxation, labor economics, monetary theory and prices, international economics, public utilities and comparative economic systems.

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

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 completed for the Bachelor of Arts degree with a major in economics.

Unless circumstances peculiar to the student's best interest indicate otherwise, the student shall take in the sophomore or junior year, Economics 201-202-203; Mathematics 116 (or equivalent), 125, Computer Science 101; Political Science 201-202-203; History 261-262; Anthropology 152 or Sociology 101; Philosophy 110; in the junior or senior year, Economics 301 and 311. It is strongly recommended that all students also take mathematics 118 or 153. It is also suggested that the student take Business Administration 201-202.

The following may be counted as part of the 50 credits required for a major in Economics: Geography 211; History 347-348-349, 373-374-375, 473-474; Political Science 365; Mathematics 118 or 153, 344-345-346; Business Administration 360, 421, 460. It is recommended that the student take Business Administration 201-202.

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

COMBINED MAJORS. Minimum of 60 credits. Combined majors in economics and political science may be earned by meeting the following requirements with the remainder of credits selected according to the student's interests. Economics 201-202-203; Mathematics 125; Economics 301, 311, and at least 12 additional credits in upper division courses. Political Science 201-202 and 18 additional credits of which 12 must be in upper division courses. A comprehensive examination is required of seniors with a major in the Economics-Political Science concentration.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

101 **CULTURAL ECONOMICS** 5, Su 3. Institutional development of economic society; nature, origins and problems of modern capitalism.

201-202-203 **PRINCIPLES OF ECONOMICS** 3. (201) Nature of American economy, capitalistic production, money and its use, economic instability. (202) Markets, value and price. (203) Functional distribution of income; selected economic topics.

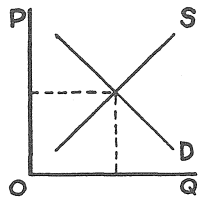
FOR UNDERGRADUATES AND GRADUATES

301 **MONEY AND BANKING** 4 prereq 203 Role of money; banks as suppliers of money; Federal Reserve System as regulator of money; monetary theories, history and policy.

304 **PUBLIC FINANCE** W 4, Su 3, prereq 203. Principles and problems of Federal financing.

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

306 **PUBLIC EXPENDITURE POLICY** 3 prereq 203. Economic analysis of public expenditure programs; the nature 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.



311-312-313 **INTERMEDIATE ECONOMIC ANALYSIS** 4 prereq 203. (311) Theory of the firm. (312) Input analysis and welfare conditions. (313) Macroeconomic analysis.

315-316 **DEVELOPMENT OF ECONOMIC THEORY** W 4, S 2, Su 3 prereq 203. (315) Economic ideas from early times to 1890. (316) Economic theories from 1890 to the present.

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

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

331-332 **INTRODUCTION TO INTERNATIONAL ECONOMICS** A 4, W 3, Su 3 prereq 203. (331) Theoretical analysis; (332) Problems of policy-making.

338 **ECONOMICS OF CONSUMPTION** 3 prereq 203. Nature and analysis of consumers' decision-making.

345 **ECONOMIC DEVELOPMENT** 4 prereq 203. Theoretical determinants of economic growth in poor and rich countries.

350-351 **ECONOMETRICS** 4 prereq Math 125; 118 or 152. (350) General linear regression models; (351) Econometric theory and multiple equation models.

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

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

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

375 **THE RUSSIAN ECONOMY** 4, Su 3 prereq 203.

376 **MONOPOLY AND COMPETITION** 3 prereq 311. Theories of imperfect markets and workable competition as applied to public policy.

382 **CONTEMPORARY ECONOMIC PROBLEMS** 3 prereq 203.

385 **LAND ECONOMICS** 3 prereq 301. Economic and physical characteristics of land and the institutional background of real property; classifications of properties and market analysis; cyclical market fluctuation; impact of supply and demand; city growth, structure and planning; land use control, and real estate investment analysis.

387 **PROPERTY VALUATION THEORY** 3 prereq 385. The theoretical basis for appraising and basic value principles and non-economic limitations thereon; market indicators, locational analysis, classic approaches to value, valuation techniques, capitalization techniques, correlating the approaches.

406 **MONETARY THEORY** 4 prereq 301.

410 **ADVANCED ECONOMIC ANALYSIS** 4 prereq 25 credits in economics including 311.

451-452 **MATHEMATICAL ECONOMICS** 4 prereq 312 and Math 125. (451) Constrained maximization, maximization over time; (452) Input-output analysis, general equilibrium and programming, utility theory and game theory models.

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

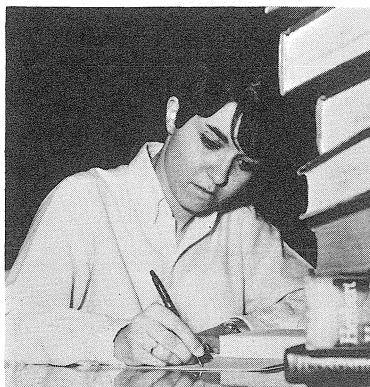
495 **SEMINAR IN ECONOMICS** V 1-3 R-12 prereq c/i.

FOR GRADUATES

501 **GRADUATE RESEARCH** V R-6.

510-511-512 **ECONOMICS** 3. Elements of analytical economics: the American economy, characteristics, performance; macro-economics, money and banking, monetary and fiscal policy; growth and stabilization; markets, pricing of outputs and inputs, government regulation; distribution theory and public policies; the public economy; the world economy, and the economic development. (Open only to MBA and MRA students.)

699 **THESIS** V R-15.



EDUCATION

Teacher education at the University of Montana prepares for teaching in any of the twelve grades. Prospective elementary and secondary teachers must have earned a bachelor's degree, have satisfactorily completed certain specified courses, and have demonstrated competence in student teaching before they become eligible for recommendation by the University of Montana for state certification to teach. Patterns of courses to be completed are planned in terms of the particular fields in which the student expects to teach.



KEEP IT BRIGHT

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 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.

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

Students preparing to teach in the elementary grades should major in Education; those preparing to teach particular subjects, either in junior or senior high schools, major in the principal subject to be taught or in Education; those preparing for library work major in Education, take courses in Library Service; those preparing for counseling, supervising, administering, or research work usually major in Education.

Other areas in which courses are acceptable for Education credit include Art, Business Administration, Chemistry, English, Foreign Languages, General, Geology, Health and Physical Education, Home Economics, Journalism, Mathematics, Music, Physics, Religion, and Speech.

ADMISSION TO TEACHER EDUCATION. All students preparing to teach must apply for admission to teacher education at the time they enroll for Education 200, or no later than the beginning of the junior year. To be admitted to teacher education, a student must have at least a "C" or 2.0 average in all courses attempted. To continue in teacher education, a student must maintain a "C" or 2.0 average in all courses undertaken in (1) Education, and (2) all other courses. (Please note below under Admission to Professional Quarter.)

Introduction to Psychology, although not counting toward the Education requirements, is prerequisite to all courses in Education and should be taken in the freshman or sophomore year. Students preparing to teach in the elementary grades should take Introduction to Psychology in the freshman year and Child and Adolescent Psychology in the sophomore year.

ADMISSION TO PROFESSIONAL QUARTER AND STUDENT TEACHING. During the spring quarter of the student's junior year formal application for student teaching and assignment to a full quarter's work in professional education must be made on forms obtained from the Director of Student Teaching. Normally, the professional quarter occurs during the student's senior year.

Elementary: to qualify for this assignment, the student must (1) be eligible to continue in teacher education, (2) have a minimum of 2.3 grade point average on all courses attempted, (3) have the consent of the Director of Student Teaching. The professional quarter for the student preparing for elementary certification entails student teaching for an entire day for one full quarter (15 credits) and enrollment in Education 407, Problems in Teaching (3 credits).

Secondary: to qualify for this assignment, the student must (1) be eligible to continue in teacher education, (2) have completed $\frac{2}{3}$ of the work in the teaching major (and minor, if any), with a minimum grade point average of 3.3 on all courses attempted in

the teaching major (and minor, if any) and a minimum overall grade point average of 2.3 in all courses attempted, and (3) have the consent of the Director of Student Teaching.

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

Preparation for Teaching in the Secondary Grades: Candidates must earn a minimum of 40 credits in Education, including the following required courses totaling 35 credits: Education, 200, 205, 305, 342, 405 (10 credits), 407, 450 and 452 or their equivalents, and elective courses totaling 5 credits selected from other courses in Education. Students wishing to qualify for standard secondary certification are required to earn 45 or more credits in a teaching major and 30 or more credits in a teaching minor. Requirements for teaching majors and minors in various areas will be found in the last few pages of the Education section of the catalog.

Suggested Curriculum in Secondary Education:

Freshman Year			
	A	W	S
	Cr.	Cr.	Cr.
Engl. 150—Freshman Composition		3	
Group Requirements, Life Sciences	4	3	5
Group Requirements, Social Sciences	5	4	3
Group Requirements, Humanities	3	3	3
Psych. 110—Introduction to Psychology			5
Electives	3	3	
H&PE 100 or 115—Physical Education or			
Prof. Activities	1	1	1
	16	17	17
Sophomore Year			
Engl. 250—Intermediate Composition			3
Group Requirements, Physical Sciences and			
Mathematics	5		
Group Requirements, Humanities		3	
Educ. 200—Orientation to Education	2		
Educ. 205—Educational Psychology		4	
Teaching Major	5-7	5-7	6-9
Teaching Minor	3-5	3-5	6-8
H & PE 100 or 115—Physical Education or			
Prof. Activities	1	1	1
	16-18	16-18	16-18
Junior Year			
Engl. 350—Advanced Composition	3		
Educ. 342—The School Library in Teaching	3		
Educ. Electives (Special Area Methods or Others)		3	3
Teaching Major	6-8	9-12	9-12
Teaching Minor	3-5	3-5	3-5
	15-17	15-17	15-17
Senior Year			
Educ. 305—Secondary School Teaching Procedures	5		
Educ. 405—Student Teaching: Secondary	10		
Educ. 407—Problems in Teaching	3		
Educ. 450—Secondary School Guidance		4	
Educ. 452—Educational Measurement			4
Electives or Courses to complete Teaching			
Major and/or Minor		12	12
	18	16	16

Preparation for Teaching in the Elementary Grades. Candidates must earn a minimum of 40 credits in Education including the following required courses totaling 40 credits: Education 200, 202, 308, 309, 310, 340, 404, 407.

In addition, the student will complete work in the following areas: English, 21 credits; Social Studies, 28 credits; Science, 18 credits; Mathematics, 9 credits; Health and Physical Education, 8 credits; Psychology, 10 credits; Art, 6 credits; and Music, 6-8 credits.

For elementary teachers, Group I and II requirements may be satisfied by the following: General 125, 126, 127, and Mathematics 130, 220.

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

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

Suggested Curriculum in Elementary Education:

Freshman Year

	A Cr.	W Cr.	S Cr.
Engl. 150—Freshman Composition			3
Gen. 125-126-127—Science for Elementary Teachers	5	5	3
Speech 111—Introduction to Public Speaking			3
Psych. 110—Introduction to Psychology	5		
Gen. 151-152-153—Introduction to the Humanities	3	3	3
Geog. 101—Physical Elements of Geography			5
Music 122-123-124—Music Educ. in the Elem. Schools	2		3
H & PE 100 or 115—Physical Education or Prof. Activities	1	1	1
	16	17	18

Sophomore Year

Educ. 200—Orientation to Education		2	
Educ. 202—The Elementary School Child			5
Engl. 250—Intermediate Composition			3
H&PE 199—First Aid			2
Hist. 261-262—United States History	4	4	
Math. 130—Theory of Arithmetic		5	
Math. 220—Intuitive Geometry			4
Psych. 230—Child and Adolescent Psychology	5		
Pol. Sci. 201—American Government	5		
Soc. Sciences—Elective Courses		5	
H&PE 100 or 115—Physical Education or Prof. Activities	1	1	1
	15	17	15

Junior Year

Educ. 340—Survey of Children's Literature			3
Educ. 308—Teaching Elem. School Reading and Other Language Arts	5		
Educ. 309—Teaching Elementary School Mathematics		3	
Educ. 310—Teaching Elementary School Science and Social Studies			4
Engl. 350—Advanced Composition	3		
Art 303-304—Elementary School Art	3	3	
Gen. 300—Conservation of Natural and Human Resources in Montana		3	
H & PE 339—Teaching Physical Education in Elementary Schools			3
H&PE 373—The School Health Program		3	
Social Sciences—Elective Courses	5		
Electives		4	6
	16	16	16

Senior Year

Educ. 404—Student Teaching: Elementary	15		
Educ. 407—Problems in Teaching	3		
Electives		16	16
	18	16	16

RECOMMENDATIONS FOR MONTANA TEACHING CERTIFICATES. The University of Montana recommends its graduates who meet state certification requirements to the State Department of Public Instruction. All such recommendations must be approved by the Dean of the School of Education. Students who expect to teach in states other than Montana should investigate specific requirements because they differ in various states.

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.

2. Twenty-four or more quarter credits in Education designated by the Dean of the School of Education (see Preparation for Secondary Teaching below).

3. A teaching major (45 or more credits) and a teaching minor (30 or more credits) in fields commonly taught in high schools (see Course Requirements in Teaching Major and Minor Fields below).

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

1. Bachelor's degree from the University of Montana or other approved institution of higher education 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 are required to file with the School of Education at least two quarters preceding the quarter of practice teaching a statement of their intended teaching fields. Those students who expect to be certified to teach in the elementary grades will similarly submit a statement setting forth their proposed programs. Each candidate for a certificate who has not already received credit in Student Teaching (Educ 404 or 405) will be assigned definite quarters in which he must register for that course.

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

Freshman year: Psych 110 (not counted among the 24 credits required for secondary certification).

Sophomore year: Educ. 200, 2 credits.

Junior year: Educ. 205, 4 credits.

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

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

The University of Montana does not offer a two-year diploma program leading to provisional elementary certification.

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

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

PREPARATION FOR SCHOOL LIBRARIANS. The library service program is designed to train school and teacher-librarians to meet the requirements of the Northwest Association of Secondary and Higher Schools and of the state of Montana. The minimum requirement for schools of under 100 enrollment includes Education 343, 344, and 345. The student planning a more extended program should consult the library service instructor for advice on additional courses.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

200 **ORIENTATION TO EDUCATION 2** prereq Psych 110. Teaching as a profession. The American public school and its purposes. Problems, issues, and trends in education today.

202 **THE ELEMENTARY SCHOOL CHILD 5** prereq 200 and Psych 230. 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.

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

210 **OUTDOOR EDUCATION 2.** Outdoor activities and materials to enrich the elementary science program.

305 **SECONDARY SCHOOL TEACHING PROCEDURES 5** prereq 200 and 205. Methods of planning, presentation, evaluation, and discipline. The materials of classroom teaching. Demonstration, observation, and related activity involving student participation.

308 (301) **TEACHING ELEMENTARY SCHOOL READING AND OTHER LANGUAGE ARTS 5** prereq 202.

309 (302) **TEACHING ELEMENTARY SCHOOL MATHEMATICS 3** prereq 202, Math 130, 220.

310 (303) **TEACHING ELEMENTARY SCHOOL SCIENCE AND SOCIAL STUDIES 4** prereq 202.

321 **METHODS OF TEACHING HOME ECONOMICS.** (See Home Economics.)

323-324-325 **SCHOOL MUSIC.** (See Music.)

330 **PRINCIPLES OF RELIGIOUS EDUCATION.** (See Religion.)

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.

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

402 **OBSERVATION AND PARTICIPATION: (ELEMENTARY) 5,** Su only, prereq 308, 309, 310 or =; teaching experience and c/i. Observation and participation in teaching of a demonstration class of grade school students. For students with teaching experience who cannot secure the regular course in student teaching.

403 **OBSERVATION AND PARTICIPATION: (SECONDARY) 5,** Su only, prereq 305 or =, teaching experience and c/i. Observation and participation in teaching of a demonstration class of high school students. For students with teaching experience who cannot secure the regular course in student teaching.

404 **STUDENT TEACHING: ELEMENTARY 15** prereq 200, 202, 308, 309, 310, 340 and consent of Director of Student Teaching. Classroom teaching. Student teaching is a full day's work for a complete quarter, and although some observation and participation are included, the main emphasis is upon responsible student teaching. It includes as many of the regular duties and responsibilities of a teacher as can be included.

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405 STUDENT TEACHING: SECONDARY 10 prereq 200, 205, 305, and consent of Director of Student Teaching. Classroom teaching at the secondary level. Student teaching is a full day's work for a period of six weeks, and is preceded in the professional quarter by Educ. 305, Secondary School Teaching Procedures, 5 hours. Although some observation and participation are included, the main emphasis is upon responsible student teaching. It includes as many of the regular duties and responsibilities of a teacher as can be included.

407 PROBLEMS IN TEACHING 3 prereq 404 or 405 or concurrent registration. Current problems and issues in teaching.

445 LIBRARY PRACTICE 5 prereq 20 or more hours in Library Service and consent of Director of Library Service. The student performs library routines in a school, public or college library under the supervision of a trained professional librarian. Weekly meeting with Director of Library Service.

FOR UNDERGRADUATES AND GRADUATES

302 ALGEBRA FOR TEACHERS. (See Mathematics.)

303 GEOMETRY FOR TEACHERS. (See Mathematics.)

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

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

316 SCHOOL PUBLICATIONS. (See Journalism.)

322 METHODS OF TEACHING BIOLOGY. (See General.)

326 TEACHING OF CONSERVATION 3 prereq Gen 300 and 12 credits in Educ and c/i. Current conservation programs and materials. Integral part of summer Conservation Education Workshop.

327 PROBLEMS IN CONSERVATION EDUCATION prereq c/i. May be taken for 3 credits if taken concurrently with Educ 326 or for 6 credits if preceded by Educ 326 and Gen 300. Designing, selection, and evaluation of materials for the teaching of conservation.

328 METHODS OF TEACHING PHYSICS. (See Physics.)

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

331 EARLY CHILDHOOD EDUCATION 3 prereq 12 credits in Elementary Education or teaching experience and c/i. Theory and techniques of teaching in the kindergarten and primary grades as a unified program. A prerequisite to teaching in the kindergarten.

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

340 SURVEY OF CHILDREN'S LITERATURE 3.

342 THE SCHOOL LIBRARY IN TEACHING 3. The use of books and libraries. The use of library materials in subject enrichment and unit planning. (May not be counted in the teaching minor.)

343 ORGANIZATION AND ADMINISTRATION OF THE SCHOOL LIBRARY 4, Su 3. Objectives of school library service, library routines, procedures, quarters, equipment and costs. For part-time teacher-librarians without library training.

344 CATALOGING AND CLASSIFICATION 4, Su 3 prereq 341 or 343. Principles of classification and cataloging for small libraries.

345 MATERIALS SELECTION AND BIBLIOGRAPHY 4, Su 3 prereq 341 or 343. Book selection and order work for the small library. Book lists and bibliographies.

346 LIBRARY REFERENCE MATERIALS 4, Su 3 prereq 341 or 343. Basic reference books and bibliographies commonly found in small libraries; reference methods, citation, and bibliographic form.

347 AUDIOVISUAL COMMUNICATION 3. Classroom utilization of sound and visual teaching materials; intensive laboratory work including 16mm., filmstrip, slide, overhead, opaque, record player, tape recorder and related instructional material.

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 prereq teaching experience. 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 and Physical Education.)

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 ISSUES IN VOCATIONAL BUSINESS EDUCATION (See Business Administration)

386 INSTRUCTIONAL THEORY 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.)

411 (311) SUPERVISION AND 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. (Not a course in the teaching of reading.)

412 (312) 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 (314) SUPERVISION AND TEACHING OF SOCIAL STUDIES IN THE ELEMENTARY SCHOOL 3 prereq teaching experience. Curricular trends, instructional practices, teacher-pupil planning and evaluation, unit organization, integration with other areas, and use of community resources.

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

418 (318) SUPERVISION AND TEACHING OF SCIENCE IN THE ELEMENTARY SCHOOL 3 prereq Gen 125-126-127 or = and Educ 202. Curriculum planning, development and use of instructional materials, teaching procedures.

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

421 ADVANCED PROBLEMS IN TEACHING HOME ECONOMICS. (See Home Economics.)

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

425 SAFETY EDUCATION AND DRIVER TRAINING 3 prereq c/i. Supervised experience in teaching driving and theoretical aspects of driver education. General safety education. To prepare teachers for Safety Education and Driver Training courses in high schools. Offered in cooperation with the American Automobile Association and the Montana Highway Patrol.

426 ADVANCED SAFETY EDUCATION AND DRIVER TRAINING 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. Offered in cooperation with the American Automobile Association and the Montana Highway Patrol.

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

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

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

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

434 REMEDIAL READING LABORATORY 3 or 5 credits R-8 prereq or coreq 334 and c/i. Supervised practice in diagnosis and remedial instruction, 1 hour per day work with selected elementary, secondary, or college students. Seminar meetings.

438 THE JUNIOR HIGH SCHOOL 3 prereq 205 or teaching experience. Objectives, organization, class scheduling, curriculum, and extra-curricular activities.

440 LIBRARY PROGRAMS IN ELEMENTARY SCHOOLS o/y 3 prereq course in children's literature. Functions and use of classroom collections and centralized libraries for curriculum enrichment experiences, reading, guidance, and teaching library skills. Responsibilities of classroom teachers, 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 e/y prereq 341 or 343 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 9 credits in Library Service. Problems of library service. General sessions and committee work; individual work on problems of special interest within the workshop topic.

444 LIBRARY SEMINAR V 1-5 R-10 prereq 20 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.

38—EDUCATION

**COURSE REQUIREMENTS
IN TEACHING MAJOR AND MINOR FIELDS**

Students who wish to qualify for the Montana Secondary State Teaching Certificate must, according to the regulations of the State Department of Public Instruction which were in effect when this catalog was printed, complete a minimum of 45 credits in a major teaching field and a minimum of 30 credits in a minor teaching field. (Single endorsements on certificates will be allowed if the student presents a minimum of 60 credits in the teaching major in courses approved by both the department (or school) involved and the School of Education.) In case the patterns of teaching majors and minors are changed by the State Department of Public Instruction subsequent to the issuance of this catalog, the University reserves the right to modify accordingly the requirements listed below.

Major teaching requirements are not necessarily the same as major departmental requirements for graduation. The student might qualify for the state certificate in a subject field by earning 45 credits, but still not meet requirements for graduation as a major in the University department. Students who graduate with a major in a subject field taught in Montana high schools will ordinarily qualify for the certificate, provided other requirements are met. Students should keep in mind that a course may not be counted in more than one teaching major or minor.

ART

	Teaching Major (60 credits)	Teaching Minor (31 credits)
Required Courses:		
Art 123—Drawing	9	9
Art 125, 126, 127—Design	6	4
Art 129—Ceramics	2	-
Art 160—Layout and Lettering	2	-
Art 200, 201, 202—Survey of Western Art	9	6
Art 233—Printmaking	2	2
Art 235—Sculpture	6	3
Art 239—Water Color	3	3
Art 240—Painting	6	3
Art 303, 304—Elementary School Art	6	3
Art 307—Methods of Teaching Secondary Art	3	3
Art 325—Advanced Design Photography	3	-
Crafts	3	-

BUSINESS ADMINISTRATION

	Teaching Major (45-47 credits)	Teaching Minor (34 credits)
Required Courses:		
*Bus. Ad. 183—Advanced Typewriting	2	2
**Bus. Ad. 184, 185, 186—Stenography	15	15
Bus. Ad. 193—Beginning Secretarial Practice	2	2
Bus. Ad. 194—Records Management	2	-
Bus. Ad. 201, 202—Accounting Principles	6	6
Bus. Ad. 203—Elementary Accounting	3	3
Bus. Ad. 292—Office Machines Practice	2	-
Bus. Ad. 380—Methods of Teaching Typewriting	2	2
Bus. Ad. 381—Methods of Teaching Book- keeping and Basic Business	2	2
Bus. Ad. 383—Office Management	3	-
Bus. Ad. 384—Methods of Teaching Short- hand and Transcription	2	2
Electives from the following:	4-6	-
Bus. Ad. 306, 307—Intermediate Accounting	8	-
Bus. Ad. 330—Principles of Insurance	3	-
Bus. Ad. 357, 358—Legal Environment of Business	6	-
Bus. Ad. 360—Marketing	3	-
Bus. Ad. 385—Issues in Vocational Business Education	3	-
Bus. Ad. 386—Instructional Theory in Voca- tional Business Education	3	-
Bus. Ad. 387—Cooperative Business Vocational Education Programs	3	-
Bus. Ad. 370—Electronic Information Processing	3	-
Econ. 201, 202, 203—Principles of Economics	9	-
Econ. 301—Money and Banking	4	-

*Bus. Ad. 180, 181, 182 are not applicable in the major or minor area.
**Bus. Ad. electives must be taken in place of any of these courses which may be waived.

DRAMA (Minor only)

	Teaching Minor (30 credits)
Required Courses:	
Drama 101—Introduction to the Theater	3
Drama 121—Elementary Acting	3
Drama 131, 132, 133—Elementary Stagecraft (any 2)	8
Drama 244—Stage Make-up	2
Drama 201, 202, 203—Dramatic Literature (any 2)	6
Drama 311—Directing	4
Electives: Any courses in Drama except 100	4

ECONOMICS (Minor only)

	Teaching Minor (30 credits)
Required Courses:	
Econ. 201, 202, 203—Principles of Economics	9
Econ. 301—Money and Banking	4
Econ. 311—Intermediate Economics Analysis	4
Electives: Economics courses	13

ENGLISH

	Teaching Major (60 credits)	Teaching Minor (30 credits)
Required Courses:		
Engl. 161, 162—World Literature	6	-
Engl. 211, 213—Introduction to Major British Writers	6	6
Engl. 232, 233—Introduction to Major American Writers	6	6
Engl. 342 or 343—Shakespeare	3	3
Engl. 371—The Structure of Modern English	3	3
Engl. 382—Methods of Teaching English	3	3
Engl. 450—Problems in Composition	3	3
Engl. 482—Literature for the High School Teacher	3	3
Speech 118—Practicum in Oral Expression	3	-
Electives:	24	3

Among the elective courses there must be at least one advance course in American literature and one advanced course in British literature. General 360 and other courses in General Literature may also be taken. Additional electives from the related fields of Drama, Journalism, and Speech are strongly recommended. (English 150, 250, and 350 may not be included in the teaching major or minor.)

ENGLISH (Broad Fields Major only)

	Teaching Major (75 credits)
Required Courses:	
Engl. 211, 213—Introduction to Major British Writers	6
Engl. 232, 233—Introduction to Major American Writers	6
Engl. 342 or 343—Shakespeare	3
Engl. 371—The Structure of Modern English	3
Engl. 382—Methods of Teaching English	3
*Engl. 450—Problems in Composition	3
Engl. 482—Literature for the High School Teacher	3
**Electives:—English courses	18
Speech 111—Introduction to Public Speaking or 118—Practicum in Oral Expression	3
Jour. 290—History and Principles of Journalism	3
Jour. 316—School Publications	3
Drama 311—Directing	4
Drama 371—Theater Production in the High School	3
Electives:—Must be chosen from courses in only one of the following areas: Drama, Journalism, or Speech 14	

*Drama majors may substitute Engl. 306 for Engl. 450 if desired.

**English electives must include one upper division course in British literature and one in American literature. English electives may include General literature courses and General 360. A minimum of 45 credits in English must be taken. (English 150, 250, and 350 may not be included in the major.)

FOREIGN LANGUAGES

Language taken in high school will be recognized by the University in fulfilling the equivalent for teaching major or minor in a language.

A recommendation by the Foreign Language Department to the School of Education regarding the proficiency of the student is prerequisite to student teaching. (This pertains to both Teaching Majors and Teaching Minors.)

FRENCH

	Teaching Major (48 credits)	Teaching Minor (36 credits)
Required Courses:		
Fr. 101, 102, 103—Elementary French	15	15
Fr. 201, 202, 203—Intermediate French	12	12
Fr. 301—Applied Linguistics	3	3
Fr. 302—French Composition and Conversation	3	3
Fr. 311, 312, 313—Survey of French Literature	6	-
For. Lang. 390—Methods of Teaching Foreign Languages	3	3
Electives:—French courses numbered over 300	6	-

GERMAN

	Teaching Major (48 credits)	Teaching Minor (36 credits)
Required Courses:		
Ger. 101, 102, 103—Elementary German	15	15
Ger. 201, 202, 203—Intermediate German	12	12
Ger. 301—Applied Linguistics	3	3
Ger. 302—German Composition and Conversation	3	3
Ger. 311, 312, 313—Survey of German Literature	6	-
For. Lang. 390—Methods of Teaching Foreign Languages	3	3
Electives:—German courses numbered over 300	6	-

ITALIAN (Minor only)

	Teaching Minor (35 credits)
Required Courses:	
Ital. 101, 102, 103—Elementary Italian	15
Ital. 211, 212—Italian Readings	8
Ital. 217—Italian Grammar Review and Composition	3
Ital. 311, 312, 313—Survey of Italian Literature	3
For. Lang. 390—Methods of Teaching Foreign Languages	3

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 4 prereq basic courses in field or c/i. Management of an integrated program and administration of communications media for elementary or secondary school programs.

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

451 GUIDANCE IN THE ELEMENTARY SCHOOL 4 prereq 308, 309, 310 or teaching experience. Orientation to the need, organization, and methodology of guidance services in the elementary schools.

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

461-462 HISTORICAL FOUNDATIONS OF AMERICAN EDUCATION 3. Historical and philosophical backgrounds of present day trends and issues in Education. Enter either quarter. (461) to 1650; (462) 1650 to present.

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

494 SEMINAR V R-10 prereq 12 credits in Education and c/i. Group analysis and discussion of individual projects. Application to specific teaching situations where possible.

FOR GRADUATES

505 INTERNSHIP V 1-6 R-6. Supervised field experiences in administration, guidance, special education, curriculum. (Admission by application only.)

530 CURRICULUM FOUNDATIONS 3 prereq c/i. An analysis of the bases for curriculum in the light of historical perspective, value systems, current curriculum patterns, educational objectives, and research in growth and development.

531 ELEMENTARY CURRICULUM 4, Su 3 prereq 530 or c/i. Major trends in course content, grade placement, organization of materials, and evaluation of outcomes.

532 HIGH SCHOOL CURRICULUM 4, Su 3 prereq 530 or c/i. Sociological, psychological, and philosophical foundations of the high school. Curriculum trends in the separate subjects, and organizing for curriculum development.

533 JUNIOR HIGH SCHOOL CURRICULUM 4, Su 3, prereq 530 or c/i. Sociological, psychological, and philosophical foundations of the junior high school. Curriculum trends in the separate subject areas, and organization and administration of the junior high school for implementation of curriculum.

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 Piaget, 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 prereq 450 or 451, and 452. Procedures used by counselors who work with students in groups. Emphasis upon group processes, interaction and experience.

554 (454) OCCUPATIONAL INFORMATION 3 prereq 450 or =. Sources, including job analysis and surveys; occupational trends, classification, filing system, evaluation, selection, and use of occupational information.

555 THEORIES OF COUNSELING 5 prereq 450 or 451, and 552. Current theories of counseling as applied by the school counselor in individual counseling.

556 SUPERVISED COUNSELING PRACTICE 5 prereq 555. Supervised practice in counseling students on an individual basis.

557 ORGANIZATION AND ADMINISTRATION OF PERSONNEL SERVICES 3 prereq 556. The development and organization of guidance services in the school with emphasis on philosophy, organization procedures and faculty involvement.

558 SEMINAR IN COUNSELING AND GUIDANCE 2 prereq 555 and 556. Current literature and research in the counseling and guidance field.

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

564 PHILOSOPHY OF EDUCATION 3. Leading philosophical points of view in Education; concepts of the individual, society, the educative process, and the role of education.

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

568 SOCIOLOGICAL FOUNDATIONS OF AMERICAN EDUCATION 3 prereq 360 or 564 or = and c/i. The background of education in its broadest sense as found in the religion, 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. The relationship of the school to the community as the school strives to utilize more fully community educational resources. Resource people and an inter-disciplinary approach to be used.

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

572 ELEMENTARY SCHOOL ADMINISTRATION 3 prereq teaching experience. Problems in administering the elementary school. Role and competencies of the elementary principal.

573 SECONDARY SCHOOL ADMINISTRATION 3 prereq teaching experience. Administration of secondary education. Role of the principal and areas of competency.

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

575 SCHOOL SUPERVISION 4, Su 3 prereq teaching experience. Roles and responsibilities of assigned leaders for improving instruction and promoting in-service growth of personnel.

576 SCHOOL FINANCE 3 prereq teaching experience. Sources of school revenues; related costs, inequalities, legal limitations, and proper expenditures; relationship of foundation programs and district reorganization.

577 SCHOOL FACILITIES PLANNING V 2-4 prereq 570 or = and c/i. Procedures in determining school facility needs and planning for facilities through preparation 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 the concept of education as a state function. 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 student); selection, in-service training, assignment, supervision, and welfare.

581 COLLEGE TEACHING 3 prereq 30 credits of graduate work. The type of teaching applicable to the college level.

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

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

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

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

586 VOCATIONAL DEVELOPMENT THEORY 3 prereq 554. A comparison of current theories of vocational development. Special attention given to current literature.

590 INDEPENDENT STUDY V R-10 prereq consent of adviser and instructor. Selected topics under the guidance of a staff member.

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

594 SEMINAR V R-10 prereq c/i. Group analysis of problems in specific areas of education.

595 METHODS OF EDUCATIONAL RESEARCH 4. Research problems; their statement, organization, techniques, tabulation of materials, statistical concepts necessary for interpretation of research data.

597 EDUCATIONAL STATISTICS 4 prereq Math 125, Educ 452 and 595 or concurrent registration therein and c/i.

599 RESEARCH V R-15 prereq c/i.

633 CURRICULUM TRENDS IN HIGHER EDUCATION 3 prereq c/i.

638 THE AMERICAN JUNIOR COLLEGE 3 prereq c/i.

670 ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION 3 prereq c/i.

699 THESIS OR PROFESSIONAL WRITING V R-30.

LATIN

	Teaching Major (48 credits)	Teaching Minor (36 credits)
Required Courses:		
Latin 101, 102, 103—Elementary Latin	15	15
Latin 211, 212, 213—Latin Readings	11	11
Latin 490—Major Latin Writers	22	10

RUSSIAN

	*Teaching Major (48 credits)	Teaching Minor (36 credits)
Required Courses:		
Rus. 101, 102, 103—Elementary Russian	15	15
Rus. 201, 202, 203—Intermediate Russian	12	12
Rus. 301—Applied Linguistics	3	3
Rus. 302—Russian Composition and Conversation	3	3
Rus. 311, 312, 313—Survey of Russian Literature	6	-
For. Lang. 390—Methods of Teaching Foreign Languages	3	3
Electives—Russian courses numbered over 300	6	-

*The Russian teaching major is available only if accompanied by another teaching major.

SPANISH

	Teaching Major (48 credits)	Teaching Minor (36 credits)
Required Courses:		
Span. 101, 102, 103—Elementary Spanish	15	15
Span. 201, 202, 203—Intermediate Spanish	12	12
Span. 301—Applied Linguistics	3	3
Span. 302—Spanish Composition and Conversation	3	3
Span. 311, 312, 313—Survey of Spanish Literature	6	-
For. Lang. 390—Methods of Teaching Foreign Languages	3	3
Electives—Spanish courses numbered over 300	6	-

Spanish 321, 322, 323, should be taken if possible.

GEOGRAPHY (Minor only)

	Teaching Minor (35 credits)
Required Courses:	
Geog. 101—Physical Elements of Geography	5
Geog. 102—Introductory Human Geography	5
Geog. 201—Map Interpretation	3
Geog. 211—Economic Geography	5
Geog. 335—Cultural Geography	3
Geog. 360—Climatology	5
Geog. 370—Landform Analysis	3
Electives—Geography courses numbered over 300	6

*HEALTH AND PHYSICAL EDUCATION

	Teaching Major (46 credits)	Teaching Minor (34 credits)
Required Courses:		
H & PE 200—History and Principles of Physical Education	3	3
H & PE 215—Advanced Professional Preparation	3	3
H & PE 339—Teaching Physical Education in Elementary Schools	3	3
H & PE 365—Organization and Administration of Physical Education	3	3
H & PE 375—Methods in Teaching Health	3	3
H & PE 380—Applied Anatomy	3	3
H & PE 399—First Aid	3	3
H & PE 460—Seminar	1	1
H & PE 465—Measurement and Evaluation in Physical Education	3	-
H & PE 490—Teaching Physical Education Activities	2	2
For Men:		
H & PE 210, 213, 214, 223, 310, 321—Coaching	9	6
H & PE 211, 311—Officiating	2	1
H & PE 240—Care and Prevention of Athletic Injuries	3	3
H & PE 326—Methods and Materials in Folk and Square Dancing	2	-
For Women:		
H & PE 301, 302, 303—Methods	6	4
H & PE 324, 325, 326—Dance Methods	6	4
H & PE 232—Officiating Basketball	2	2
Electives:		
Men—Courses in the Department	3	-
Women—Courses in the Department	5	-

*H & PE 100 and 115 are not allowed to be counted in credits applying to the major or minor.

HISTORY AND POLITICAL SCIENCE

	Teaching Major (50 credits)	Teaching Minor (33 credits)
Required Courses:		
Hist. 101, 102, 103—Modern European Civilization	9	9
Hist. 201, 202, 203—Survey of Ancient and Medieval History	6	6
Hist. 261, 262—United States History	8	8
Pol. Sci. 201, 202—American Government	8	8
Pol. Sci. 203—Government in Montana	2	2
Pol. Sci. 231—Introduction to International Relations	3	-
Educ. 428—Methods of Teaching Social Studies in Secondary Schools	(3)	(3)
*Electives—Courses in History	14	-

*Must include at least 9 credits of upper division courses.

HOME ECONOMICS

	Teaching Major (56-62 credits)	Teaching Minor (36-40 credits)
Required Courses:		
H Ec. 155—Textile Selection	3	3
H Ec. 157—Introductory Clothing Problems	3	3
H Ec. 209—Home Management in Theory and Practice	2	-
H Ec. 210—Household Equipment	3	-
H Ec. 241—Principles of Food Preparation	5	5
H Ec. 246—Nutrition	4	4
H Ec. 258—Clothing for the Family	3	-
H Ec. 302—Home Planning	3	3
H Ec. 303—Interior Design and Furnishings	5	5
H Ec. 305—Meal Management	3	3
H Ec. 309—Family Finance	5	5
H Ec. 310—Home Living Center	4	-
*H Ec. 321—Methods of Teaching Home Economics	3	3
H Ec. 358—Advanced Clothing Problems	3	-
H Ec. 366—Child Development	3	2-3
H Ec. 367—Advanced Problems in Child Development	3	3
H Ec. 368—Human Development and Family Relationships	3	-
H Ec. 421—Advanced Problems in Teaching Home Economics	3	-
H Ec. 490—Problems in Home Economics	1	-

*Must be taken before Education 405.

JOURNALISM (Minor only)

	Teaching Minor (30 credits)
Required Courses:	
Jour. 100—Introduction to Journalism	3
Jour. 196—Current Affairs	1
Jour. 227—Elementary Photography	3
Jour. 270—Reporting	3
Jour. 290—History and Principles of Journalism	3
Jour. 316—School Publications	3
Jour. 360—Principles of Advertising	3
Jour. 371—Advanced Reporting	2
Jour. 380—News Editing	3
Jour. 495—Editorial Writing	3
R & TV 140—Introduction to Radio and Television	3

LIBRARY SERVICE (Minor only)

	Teaching Minor (30 credits)
Required Courses:	
Educ. 343—Organization and Administration of the School Library	3-4
Educ. 344—Cataloging and Classification	3-4
Educ. 345—Materials Selection and Bibliography	3-4
Educ. 346—Library Reference Materials	3-4
Electives—From the following:	14-18
Educ. 340—Survey of Children's Literature	3
Educ. 347—Audiovisual Communication	3
Educ. 440—Library Programs in Elementary Schools	3
Educ. 441—Evaluation of School Library Services and Materials	2
Educ. 442—Library Work with Children	3
Educ. 444—Library Seminar	5-10
Educ. 445—Library Practice	5
Engl. 482—Literature for the High School Teacher	3

MATHEMATICS

	Teaching Major (50 credits)	Teaching Minor (30 credits)
Required Courses:		
Math. 121—Elementary Functions (College Algebra and Trigonometry)	5	5
Math. 125—Statistics	5	-
Math. 151—Analytic Geometry and Calculus I	5	5
Math. 152—Analytic Geometry and Calculus II	5	5
Math. 153—Analytic Geometry and Calculus III	5	5
Math. 251—Analytic Geometry and Calculus IV	5	-
Math. 252—Analytic Geometry and Calculus V	5	-
Math. 301—The Real Number System	5	-
Math. 302—Algebra for Teachers	5	5
Math. 303—Geometry for Teachers	5	5

40—EDUCATION

MUSIC

	Teaching Major (60 credits)	Teaching Minor (30 credits)
Required Courses:		
Music 111, 112, 113—Theory I	6	6
Music 135—Introduction to Music Literature	4	4
Music 138, 139—Aural Perception I	4	4
Music 211, 212, 213—Theory II	6	-
Music 237, 238, 239—Aural Perception II	6	-
Music 323, 324, 325—School Music	6	-
Music 331—Conducting Methods and Materials	3	3
Music 332, 333—Conducting Methods and Materials	8	-
Music 201, 401—Secondary Applied Major	11	-
Music 100—Secondary Applied Minor	-	5
Electives—From the following	6	8
Music 114, 115, 116—Piano in Class	3	3
Music 117, 118, 119—Voice in Class	3	3
Music 125, 126, 127—String Instruments in Class	3	3
Music 128, 129, 130—Woodwind, Brass, Percussion and Band	2-6	2-6
Music 320—Piano Methods and Materials	3	-
Music 323, 324, 325—School Music	-	2-6
Music 332, 333—Conducting Methods and Materials	-	4-8

All majors and minors must demonstrate piano ability equivalent to 3 quarters of piano study (private or in class). Vocal majors and minors may substitute other Music courses with the approval of the chairman of the Music Department.

*PSYCHOLOGY

	**Teaching Major (45 credits)	Teaching Minor (30 credits)
Required Courses:		
Psych. 220—Psychological Statistics	5	5
Psych. 230—Child and Adolescent Psychology	5	5
Psych. 240—Social Psychology	5	5
Psych. 310—Sensory Processes and Perception	5	5
Psych. 311—Learning	5	5
Psych. 361—Abnormal Psychology	5	5
Electives—Any courses selected from Psychology	15	-

*Psychology 110 is prerequisite to the major and minor but not counted in credits allowable.

**The Psychology teaching major is allowed only if the student presents another teaching major.

SCIENCE

Students planning to qualify for a secondary teaching certificate based on either a teaching major or minor in science must, before the completion of the sophomore year, secure approval of course offerings in science by the science-education adviser in the School of Education.

Science minors may be taken only by students with a teaching major in another science or in mathematics.

BIOLOGICAL SCIENCE

	Teaching Major (59-62 credits)	*Teaching Minor (36-37 credits)
Required Courses:		
Micro. 200—General Microbiology	5	5
Bot.-Zool. 111—Introduction to Biology	5	-
Bot. 112, 113—General Botany	10	10
Bot. 265—Local Flora	4	-
or		
Zool. 206—Field Zoology	3	-
Bot. or Zool. 250—Basic Concepts of Ecology	3	-
or		
Bot. 355—Principles of Plant Ecology	5	-
or		
Zool. 112, 113—General Zoology	10	10
Gen. 300—Conservation of Natural and Human Resources	3	-
Bot. 325—Plant Physiology	5	5
or		
Zool. 202—Human Physiology	5	-
Bot.-Zool. 485—Genetics	5	-
Gen. 322—Methods of Teaching Biology	3	-
Gen. 132—Evolution, Genetics, and Man	3	3
Bot. 265—Local Flora	4	-
or		
Bot. or Zool. 250—Basic Concepts of Ecology	3	3-4
or		
Gen. 300—Conservation of Natural and Human Resources	3	-
Electives—Upper division Biology courses	5-7	-
Supporting work required for major:		
**Chem. 101, 102, 160	13	-
Geol. 101, 102, 103 or Physics 111, 112, 113	10-12	-
Math. 116	5	-

*Allowed only if accompanied by a teaching major in Chemistry or Earth Science.

**Students minoring in Chemistry should substitute Chem. 121, 122, 123.

CHEMISTRY

	Teaching Major (49 credits)	*Teaching Minor (33 credits)
Required Courses:		
Chem. 121, 122, 123—College Chemistry	15	15
Chem. 245—Quantitative Analysis	5	5
Chem. 261, 262—Organic Chemistry	10	5
Chem. 329—Methods of Teaching High School Chemistry	3	3
Chem. 370—Survey of Physical Chemistry	3-5	5
or		
Chem. 371—Physical Chemistry	-	-
Chem. 452—Inorganic Chemistry	3	-
Chem. 481—Elementary Biochemistry	5	-
Electives—Chemistry courses numbered over 300	3-5	-

*In the minor the following substitutions will be allowed: Chem. 160 for Chem. 261, and Chem. 262 for Chem. 370. Chem. 370 or 371 is prerequisite for Chem. 452.

EARTH SCIENCE

	Teaching Major (56 credits)	Teaching Minor (34 credits)
Required Courses:		
Geog. 101—Physical Elements of Geography	5	5
Geol. 110—Physical Geology	5	5
Geol. 120—Introduction to Geologic Maps and Aerial Photos	3-4	-
or		
Geog. 201—Map Interpretation	3	-
Geol. 130—Field Methods	4	4
Phys. 131-132—Introduction to Astronomy	4	4
Geol. 200—General Paleontology	4	4
Geol. 203—Historical Geology	4	4
For. 210—Elementary Soils	4	4
Geol. 210—Introduction to Rocks and Minerals	4	4
Gen. 300—Conservation of Natural and Human Resources	3	-
Geol. 310—Geomorphology	3	-
or		
Geog. 370—Landform Analysis	3	3
Geol. 306—Methods of Teaching Earth Science	5	5
Geog. 360—Climatology	4-6	-
Electives:		
Phys. 113—General Physics	5	5
Geol. 202—Principles of Stratigraphy	4	4
Bot. or Zool. 250—Basic Concepts of Ecology	3	3
Geol. 330—Structural Geology	3	3
Geol. 302—Field Geology for Natural Science Teachers	3	3
Geog. 301, 302—Physiography of North America	3-6	-
Geol. 408—Introduction to Vertebrate Paleontology	4	4
Geol. 440—Introduction to Geophysics	3	3

*GENERAL SCIENCE (Broad Fields Major only)

	Teaching Major (75 credits)
Required Courses:	
Micro. 100—Elementary Microbiology	3
Bot. 111 or Zool. 111—Introduction to Biology	5
Bot. 112—General Botany	5
Bot. 265—Local Flora	4
Chem. 101, 102—General Chemistry	8
Chem. 160—Survey of Organic Chemistry	5
Gen. 300—Conservation of Natural and Human Resources	3
Geol. 101—Introduction to Geology	4
Physics 111, 112, 113—General Physics	15
Physics 131, 132—Introduction to Astronomy	4
Zool. 112, 113—General Zoology	10
Zool. 206—Field Zoology	3
Educ. 420—Methods of Teaching Secondary Science	(3)
Electives—Courses from Geology, Botany, Chemistry, Physics, Zoology	6

*Does not qualify for teaching Chemistry or Physics.

PHYSICS

	Teaching Major (45 credits)	Teaching Minor (33 credits)
Required Courses:		
Phys. 221, 222, 223—General Physics	15	15
Phys. 301—Vector Analysis	3	3
Phys. 314—Electricity	3	3
Phys. 322, 323—Light	4	4
Phys. 328—Methods of Teaching Physics	3	3
Phys. 341—Fundamentals of Modern Physics	5	5
Phys. 371—Mechanics	3	-
Phys. 441—Advanced Laboratory	2	-
Phys. 480—Physics Seminar I	1	-
Electives—From Physics courses	6	-

Math courses must be taken to satisfy requirements of the various physics courses.

SOCIAL SCIENCES (Broad Fields Major only)

	Teaching Major (75 credits)
Required Courses:	
Econ. 201, 202, 203—Principles of Economics	9
Geog. 331—Political Geography	3
Geog. 335—Cultural Geography	3
Hist. 101, 102, 103—Modern European Civilization	9
Hist. 201, 202, 203—Survey of Ancient and Medieval History	8
Hist. 261, 262—United States History	8
Pol. Sci. 201, 202—American Government	8
Pol. Sci. 203—Government in Montana	2
Soc. 101—Introductory Sociology	5
Educ. 428—Methods of Teaching Social Studies in Secondary Schools	(3)
Electives —Limited to upper division courses in the areas of Anthropology, Economics, Geography, History, Political Science, Sociology, and must include at least two courses in history, one in economics, one in geography and one in sociology	22

SOCIOLOGY (Minor only)

	Teaching Minor (32 credits)
Required Courses:	
Anthro. 152—Man and His Culture	5
or	
Anthro. 153—Cultural Anthropology	5
Soc. 101—Introductory Sociology	5
Soc. 200—American Society	5
Soc. 207—Introduction to Social Change	5
Soc. 208—The Individual and Society	5
Soc. 307—Socialization	3
Soc. 309—Introduction to Complex Organizations	4

SPEECH

	*Teaching Major (55 credits)	Teaching Minor (35 credits)
Required Courses:		
Spch. 110—Introduction to Systems of Communication	-	3
Spch. 111—Introduction to Public Speaking	3	3
Spch. 112—Argumentation	5	-
Spch. 118—Practicum in Oral Expression	3	-
Spch. 232, 233, 234—Introduction to Communication	15	(234 only) 5
Spch. 265—Forensics	2	3
Spch. 314—Discussion and Small Groups	-	3
Spch. 330—Introduction to Speech Pathology	3	3
Spch. 353—General Semantics	3	3
Spch. 355—Speech Composition	3	3
Spch. 361—Performance of Literature	3	3
Spch. 422—Teaching Speech in the Secondary School	3	3
Spch. 445—History of American Public Address	3	3
Electives—Courses in Speech	9	-

*The teaching major is available only if accompanied by a teaching minor in English or by another teaching major.

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 66 credits in the department. 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. All prospective English majors are expected to take, in the *freshman* year, English 161, 162—World Literature.
- II. All students are expected to take, in addition, two quarters in one sequence and one in the other from English 211-212-213, and 231-232-233; English 342 or 343; 3 credits from General 360 or English 371, 372; and English 450.
- III. The foreign language requirement listed earlier in the catalog must be satisfied. Courses in Art, History, Philosophy, Psychology, and the Social Sciences are recommended.

SCHEDULE A. LITERATURE

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

English 485 (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: English 301, 302, 303 (3 credits from 306 may be substituted for one quarter in this sequence); 401, 402, 403; 3 credits from 440, 441, 442; 3 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 writing numbered above 300.

SCHEDULE C: TEACHING

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

Option 1

English 371, 382, 482; Speech 118.

Electives: Other electives may be chosen from courses in the department of English, from 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.

Option 2

English 371, 382, 482; Speech 118.

English electives: 18 credits (must include at least one advanced course in British Literature, one advanced course in American Literature, and may include courses in General Literature, and General 360.)

30 credits of electives chosen from the following Related Fields: Drama, Journalism, Speech.

Students following Option 2 must take a minimum of 45 credits in English and 30 credits in Related Fields, as defined above. The program qualifies the student for the Montana State teaching certificate in English (Broad Fields). This certificate does not require a teaching minor.

GRADUATE WORK. See Graduate School.

COMPOSITION

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

NOTE: Unless exempted by the English Department, all students are required to complete the English 150-250-350 Composition sequence. All students, unless exempted by the English Department, must take English 150 during their *freshman* year. English 250 and 350 may be taken during any two of the three remaining years, but in no case will any student be allowed to take both English 250 and English 350 in the same year.

NOTE: English 001 PREPARATORY COMPOSITION. All students who fail to achieve acceptable performance on the entrance examination must register for this course and must receive a "pass" in it before they will be allowed to enter English 150.

150 (101) FRESHMAN COMPOSITION 3. Introduction to the problems of exposition.

250 (102) INTERMEDIATE COMPOSITION 3 prereq 150. Continuation of English 150. (See Creative Writing 202, permissible as substitute.)

350 (103) ADVANCED COMPOSITION 3 prereq 250. Continuation of English 250. (See Creative Writing 352, permissible as substitute.)

351 (201) ADVANCED COMPOSITION 3. English majors may substitute this course for English 350. Non-majors c/i.

FOR UNDERGRADUATES AND GRADUATES

450 (304) PROBLEMS IN COMPOSITION 3. Required of all English majors, open to non-majors. Critical and expository writing (intended to improve a student's use of language in his own professional area).

CREATIVE WRITING

FOR UNDERGRADUATES

202 INTRODUCTION TO CREATIVE WRITING 3 prereq 150. Practice in creative writing at the introductory level. May be substituted for English 250.

301-302-303 CREATIVE WRITING 3 prereq 202 or 351 or 352 and c/i. Enter any quarter. Fiction and/or poetry.

306 THE WRITING OF DRAMA. (See Drama.)

352 (106) CREATIVE WRITING 3. English majors may substitute this course for English 351. Non-majors c/i.

FOR GRADUATES AND UNDERGRADUATES

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

440 (305) 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 (203) TECHNIQUES OF MODERN POETRY 3. Intensive reading of several contemporary poets. Primarily for advanced students in creative writing, but open to all English majors.

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

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

FOR GRADUATES

510 FICTION WORKSHOP V R-15 c/i. Fiction writing. Class and individual instruction.

511 POETRY WORKSHOP V R-15 c/i. Poetry writing. Class and individual instruction.

512 DRAMA WORKSHOP. (See Drama 541.)

699 THESIS V R-6 to 9.

LINGUISTICS

FOR UNDERGRADUATES AND GRADUATES

360 INTRODUCTION TO LINGUISTICS. (See General Courses.)

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.

483 BRITISH LITERATURE: MIDDLE ENGLISH 3. Studies in Middle English language and literature.

496 THE TEACHING OF ENGLISH AS A FOREIGN LANGUAGE 3 prereq General 360 or English 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 General (English) 360 or English 371 or c/i. Subjects vary: applications of linguistics, dialectology, stylistics, phonemics and morphemics, theories of grammar.

TEACHER TRAINING

FOR UNDERGRADUATES

482 LITERATURE FOR THE HIGH SCHOOL TEACHER 3. Open to seniors only. The literature usually taught in grades 7 through 12 with intensive study of a few selections.

FOR UNDERGRADUATES AND GRADUATES

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

FOR GRADUATES

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

LITERATURE

FOR UNDERGRADUATES

161, 162 WORLD LITERATURE 3. Enter any quarter. A reading of selected masterpieces of world literature.

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.

231-232-233 INTRODUCTION TO MAJOR AMERICAN WRITERS 3. Enter any quarter. A student with 9 credits of American Literature cannot take this course. (231) Franklin through Hawthorne. (232) Melville through Crane. (233) James through Arthur Miller.

FOR UNDERGRADUATES AND GRADUATES

307-308-309 THE DRAMA 3 o/y prereq 9 credits of Literature. Enter any quarter. (307) Aeschylus to Ibsen. (308) Ibsen to O'Neill. (309) Contemporary Drama.

310-311-312 THE NOVEL 3 prereq 9 credits of Literature. Enter any quarter. A chronological survey of the novel. (310) Eighteenth century. (311) Nineteenth century. (312) Twentieth century.

331-332-333 STUDIES IN AMERICAN LITERATURE 3 prereq 9 credits in Literature. (331) Puritanism and the American Renaissance. (332) Realism and Naturalism. (333) Contemporary American writing.

334 THE AMERICAN SHORT STORY 3. Development of the American short story with reference to trends and types. Readings from representative American short story writers.

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

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

344 THEORIES OF DRAMA 3 e/y prereq 1 quarter of 307-308-309. The critical literature 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 TO 1660 3 prereq 9 credits of literature. Restricted to metaphysical 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 upon Gray, 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. Major figures of the Victorian period: novelists (Dickens through Conrad), poets (Tennyson, Browning, Arnold, Hopkins), and essayists (Carlyle, Mill, Newman, Ruskin.)

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

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

411 MAJOR WRITERS 3 R prereq 12 credits of Literature. One major writer, American or British, will be given special attention.

423-424-425 POETRY 3 prereq 9 credits of Literature. A chronological survey, with emphasis on close reading of representative works by major writers.

431-432-433 PROBLEMS IN AMERICAN LITERATURE 3 R-18 prereq 12 credits in Literature. Enter any quarter. Special genres, figures, and intellectual currents studied in depth.

440 (305) TECHNIQUES OF MODERN FICTION (See listing under Creative Writing.)

441 (203) TECHNIQUES OF MODERN POETRY (See listing under Creative Writing.)

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

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

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

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

491-492-493 LITERARY CRITICISM 3 prereq 12 credits of Literature. Enter any quarter. A study of major critical texts. Practice in analysis and evaluation. (491) Plato to Dryden. (492) Pope to Croce (493) Contemporary criticism.

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

FOR GRADUATES

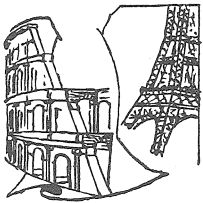
500-501-502 SEMINAR: PROBLEMS IN BRITISH LITERATURE 3 R-18. Enter any quarter. Studies in British Literature offered from various points of view: a period, a person, a genre.

600 SEMINAR: PROBLEMS IN RESEARCH V. Guidance in graduate subjects and research.

699 THESIS V R-6 to 9.

FOREIGN LANGUAGES

provide instruction and practice in speaking, reading, and writing the tongues of other peoples for commercial, governmental, or cultural purposes. Intercommunication among the nations of the world depends upon the knowledge of modern languages, and such understanding is particularly necessary as the importance of the United States increases in global affairs. Educated men and women find language skills not only important for social reasons, but as equipment for research in many fields of humanistic and scientific inquiry. Knowledge of a foreign language is also recognized as contributing greatly to the student's ability to use correctly his own tongue. Students of the modern languages are given an opportunity to supplement their classroom instruction with practice in an up-to-date language laboratory.



Language majors may find employment as teachers, interpreters, translators, airline hostesses, in commercial and scientific fields, and in various branches of the government.

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

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

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN LANGUAGES. Not more than 90 credits in all foreign languages may be counted toward the Bachelor of Arts degree. The total number of credits required for a major in a foreign language varies with the student's high school preparation or language credit transferred from another college or university. Specific requirements are set forth below under the various languages.

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

GRADUATE WORK. See Graduate School.

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 21 credits of upper division work in French.
3. Four quarters, or equivalent, of another foreign language.
4. Two quarters in history of Europe, chosen from the following: History 215, 216, 309, 310, 314, 315, 327, 328, 329.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101-102-103 ELEMENTARY FRENCH 5.

111 FRENCH FOR ELEMENTARY TEACHERS 2 prereq c/i. Grammar, conversation, and methods of teaching French in the elementary school.

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 APPLIED LINGUISTICS 3 prereq 203.
- 302 FRENCH COMPOSITION AND CONVERSATION 3 prereq 301 or c/i.
- 303 FRENCH CIVILIZATION AND CULTURE 3 prereq 203.
- 311-312-313 (301-302-303) SURVEY OF FRENCH LITERATURE 2 prereq 203. Enter any quarter.
- 421 (311) MEDIEVAL FRENCH LITERATURE 3 prereq 203.
- 422 (321) FRENCH RENAISSANCE 3 prereq 203.
- 423 (331) 17TH CENTURY FRENCH LITERATURE 3 prereq 203.
- 431 (341) 18TH CENTURY FRENCH LITERATURE 3 prereq 203.
- 432 (351) 19TH CENTURY FRENCH LITERATURE 3 prereq 203.
- 433 (361) CONTEMPORARY FRENCH LITERATURE 3 prereq 203.
- 490 (491) SEMINAR 3 R-18 prereq 203. Studies in major authors, periods, or genres.

FOR GRADUATES

- 500 DIRECTED READINGS V 1-3 R-9. Prereq undergraduate major in French.
- 590 GRADUATE SEMINAR 3 R-9.
- 699 THESIS V R 9-15.

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 21 credits of upper division work in German, which must include 311-312-313. (Teaching majors may substitute the Teaching of Foreign Languages 390 for 3 credits of upper division German.)

44—FOREIGN LANGUAGES

3. Four 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.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY GERMAN 5.

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

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

FOR UNDERGRADUATES AND GRADUATES

301 APPLIED LINGUISTICS 3 prereq 203. An introduction to the phonology, morphology, and syntax of standard High German.

302 (300) GERMAN CONVERSATION AND COMPOSITION 3 prereq 301.

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

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

431 (341) THE AGE OF GOETHE 3 prereq 311-312-313, or concurrent registration and c/i.

432 (341) FAUST 3 prereq 311-312-313, or concurrent registration and c/i.

441 (351) 19TH CENTURY REALISM 3 prereq 311-312-313, or concurrent registration and c/i.

442 (351) THE NOVELLE 3 prereq 311-312-313, or concurrent registration and c/i.

451 20TH CENTURY GERMAN LITERATURE 3 prereq 311-312-313, or concurrent registration and c/i.

460 HISTORY OF THE GERMAN 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 ELEMENTARY READING GERMAN 0. An introduction to the structure of German with full emphasis on reading. Presently offered through Extension only, when demand is sufficient.

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

590 GRADUATE SEMINAR 3 R-9.

699 THESIS V R 9-15.

GREEK

No major is given in Greek.

101-102 ELEMENTARY GREEK 5.

103 ELEMENTARY GREEK 3 prereq 102.

211-212 (213-215) GREEK READINGS 3 prereq 103.

HUMANITIES

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

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

ITALIAN

No major is given in Italian.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY ITALIAN 5.

211-212 (213-215) ITALIAN READINGS 4 prereq 103 or =.

217 ITALIAN GRAMMAR REVIEW AND COMPOSITION 3 prereq 212 or =.

FOR UNDERGRADUATES AND GRADUATES

311-312-313 (301-302-303) SURVEY OF ITALIAN LITERATURE 2 prereq 217. Enter any quarter.

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 to 213 inclusive, or equivalent.

2. At least 22 credits of Latin 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 (213-215) LATIN READINGS 4 prereq 103 or =.

213 (217) LATIN READINGS 3 prereq 212 or =.

FOR UNDERGRADUATES AND GRADUATES

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

FOR GRADUATES

699 THESIS V R-15.

ROMANCE PHILOLOGY

FOR UNDERGRADUATES AND GRADUATES

360 (375) INTRODUCTION TO ROMANCE PHILOLOGY 3 prereq 203 or 217 (Latin or a Romance Language). The development of the Romance languages from Latin to their present-day forms.

RUSSIAN

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

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

2. At least 21 credits of upper division work in Russian, which must include 311-312-313. (Teaching majors may substitute the Teaching of Foreign Languages 390 for 3 credits of upper division Russian.)

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

4. Two quarters in history of Europe, chosen from the following: History 215, 216, 305, 324, 325, 326.

FOR UNDERGRADUATES

101-102-103 ELEMENTARY RUSSIAN 5.

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

211-212 RUSSIAN 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 APPLIED LINGUISTICS 3 prereq 203. An introduction to the phonology, morphology, and syntax of standard (Moscow-Leningrad) Russian.

302 RUSSIAN COMPOSITION AND CONVERSATION 3 prereq 301.

303 RUSSIAN CIVILIZATION AND CULTURE 3 prereq 203.

311-312-313 SURVEY OF RUSSIAN LITERATURE 2 prereq 203. Enter any quarter.

421-422 19TH CENTURY RUSSIAN LITERATURE 3 prereq 311-312-313 or concurrent registration and c/i. Enter either quarter.

423 20TH CENTURY RUSSIAN LITERATURE 3 prereq 311-312-313 or concurrent registration 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 27 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. Four 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.

111 SPANISH FOR ELEMENTARY TEACHERS 2 prereq c/i. Grammar, conversation, and methods of teaching Spanish in the elementary school.

201-202-203 INTERMEDIATE SPANISH 4 prereq 103 or =. 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 (213-215) SPANISH 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 APPLIED LINGUISTICS 3 prereq 203. An introduction to the phonology, morphology, and syntax of standard Spanish.

302 (300) SPANISH COMPOSITION AND CONVERSATION 3 prereq 301.

303 CONTEMPORARY HISPANIC CIVILIZATION AND CULTURE 3 prereq 203.

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

321-322-323 (371-372) SURVEY OF SPANISH AMERICAN LITERATURE 2 prereq 203. Enter any quarter.

421 (335) 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 (353) 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 3 prereq 311-312-313, or concurrent registration 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

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

590 GRADUATE SEMINAR 3 R-9.

699 THESIS V R 9-15.

THE TEACHING OF FOREIGN LANGUAGES

FOR UNDERGRADUATES AND GRADUATES

390 (391) METHODS OF TEACHING FOREIGN LANGUAGES 3 prereq Foreign Language 203 or 217. Fundamental principles, concepts, objectives, and methods involved in the teaching of a modern foreign language. Required of teaching majors and minors in modern languages.

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 (NDEA participants only). Credits may be applied toward a graduate degree in either languages or Education.

FORESTRY

is the professional management of natural resources, primarily forests and forest lands. A forester analyzes and interprets the physical, biological, sociological, and economic problems involved in the continued production and utilization of these resources.



Forestry education provides a background of knowledge of soils, vegetation, water, and wildlife and the use of forest lands for sustained production of timber and related products, grazing by domestic and wild animals, watershed protection, and outdoor recreation. It is directed toward an understanding of the relationship of these elements to human institutions.

The four-year curricula leads to the degrees of Bachelor of Science in Forestry or Bachelor of Science in Resource Conservation. Masters degrees offered as: Master of Forestry, Master of Science in Forestry, Master of Science in Resource Conservation, Master of Science in Wildlife Management and Master of Resource Administration. The Doctor of Philosophy degree is offered in Forestry and Plant Science. (See Graduate School).

Forestry education includes laboratory and field study, affording opportunities to apply the theoretical knowledge gained in the classroom. A summer camp is not required, but all students spend the sophomore spring quarter on the Lubrecht Experimental Forest. Senior students work on field problems involving extended trips and camps. In addition, each undergraduate student must spend two summers of three months each in successful employment, gaining practical experience in work pertinent to his curriculum.

Employment opportunities for forestry graduates are substantial. The increase of intensive forestry and other resource use throughout the world is extending areas of employment for professional foresters and conservationists. At the same time, the diversity of forest conditions and users in Western Montana leads to excellent local opportunities.

Foresters are employed by government agencies, private companies, research organizations, consulting firms, and educational institutions. The curricula of the School of Forestry also prepare the students to meet Federal and State civil service requirements.

Degree candidates must complete a curriculum in forestry satisfactory to the staff of the School.

The University of Montana School of Forestry was founded in 1913, one of the original group accredited by the Society of American Foresters. It is currently one of 31 accredited schools in the nation.

HIGH SCHOOL PREPARATION. The student entering the School of Forestry should have a sound high-school background in English, mathematics, social studies, and the sciences. A minimum of one and one-half years of algebra and one year of geometry are desirable.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN FORESTRY. A minimum of 192 credits, plus required work in physical education is required. To continue as majors in the School of Forestry during the second, third and fourth years, students must maintain a grade-point average of 2.0 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 \$15.00 per quarter for travel, laboratory materials and other instructional costs.

Bachelor of Science in Forestry: this degree meets the professional requirements for foresters. There are two majors: forest resources management and forest science. Within the forest resource management major there are several options with specific course requirements. Courses common to all options constitute the core curriculum.

CORE CURRICULUM

(Courses required of all options in both Majors)

(First Year)

Course	Quarter		Credits
	A	W	
Bot 111—Introduction to Biology	5		
Bot 112—General Botany		5	
Bot 265—Local Flora			4
Chem 101-102—General Chemistry	4	4	
Chem 160—Organic Chemistry			5
Engl 150—Freshman Composition			3
For 190-191—Survey of Forestry	1		1
Math 117—Trigonometry		5	
Math 116—College Algebra	5		
PE 100—Physical Education	1	1	1

(Second Year)

Bot 325—Plant Physiology		5	
Bot 250—Plant Ecology			3
Engl 250—Intermediate Composition	3		
For 50—Slide Rule	0		
For 200—Forest Mensuration			6
For 210—Elementary Soils	4		
For 211—Forest Ecology			3
For 250—Forest Graphics		2	
For 252—Surveying			6
For 290-291—Dendrology	3	2	
PE 100—Physical Education	1	1	1

(Third Year)

Econ 201-202-203—Principles of Economics	3	3	3
Engl 350—Advanced Composition		3	
For 300—Forest Statistics	4		
For 311—Silviculture		5	
For 340—Wood Technology (or alternate For 343)		4	
For 360—General Range Management	4		
For*—Forest Protection	3		3

*Two courses in protection required, selected from fire, pathology, entomology.

(Fourth Year)

For 401—Timber Management		4	
For 420-421—Forest Economics	3	3	
For 422—Resource Policy and Administration	3		
For 480—Integrated Forest Resource Management		4	

MAJOR IN FOREST RESOURCES MANAGEMENT

This major is for students who are preparing for work in resource management, administration, and staff specialties. Every student with a forest resources management major receives a broad basic education in Forestry, and a specialized education in some particular aspect of the field. There are options in forest engineering, range, recreation, timber, wildlife, and wood utilization. Each option has specific requirements in addition to those of the core curriculum, as well as electives which are worked out with the advisor.

Specific Requirements for Option Programs:

In addition to requirements listed below the student must meet all the general University requirements and the minimum of 192 credits plus P.E., required in Forestry.

Forest Engineering: Math 118 Introduction to Calculus; Computer Science 101 Fortran II; Geol 101 Introduction to Geology; Physics 111, 112 General Physics; For: 340 Wood Technology; 343 Forest Products and Industries; 351 Aerial Photogrammetry; 357 Timber Mechanics; 452 Logging; 454-5-6 Forest Engineering; 458 Mechanical Properties of Wood; in addition, a minimum of 12 credits in Business Administration and/or Economics is required.

Range: Speech 111 Principles of Public Speaking; Computer Science 101 Fortran II; Physics 111 General Physics; Zool 112 General Zoology; Bot 366 Agrostology; For: 361 Range Forage Plants; 362 Range Ecology; 363 Range Livestock Production; 351 Aerial Photogrammetry; 330 Fire Control; 370 Principles of Wildlife Conservation; 460 Range Techniques; 461 Range Livestock Nutrition; 463 Range Economics; 464 Range Administration; 465 Regional Range Management.

Recreation: Speech 111 Principles of Public Speaking; Computer Science 101 Fortran II; Psych 110 Introduction to Psychology; Soc 101 Introduction to Sociology; Engl 450 Problems in Composition or Jour 334 Trade and Technical Journalism; For: 351 Aerial Photogrammetry; 370 Principles of Wildlife Conservation; 383 Forest Aesthetics; 385 Forest Recreation; 422-3 Resource Policy and Administration; 481 Resource Management Planning; 484 Hydrologic Principles.

Timber: Math 118 Introduction to Analytical Geometry and Calculus; Computer Science 101 Fortran II; Bus. Ad. 357 Business Law; Physics 111, 112 General Physics; For: 351 Aerial Photogrammetry; 370 Principles of Wildlife Conservation; 383 Forest Aesthetics; 400-402 Forest Management; 343 Forest Products and Industries; 452 Logging; 453 Forest Engineering.

Wildlife: Engl 450 Problems in Composition; Speech 111 Principles of Public Speaking; Bot 366 Agrostology; Zool: 112-113 General Zoology; 308, Ornithology; 309 Mammalogy; Physics 111; For: 351 Aerial Photogrammetry; 383 Forest Aesthetics; 460 Range Techniques; 470 Advanced Wildlife Conservation; 471 Big Game Conservation; 472 Wildlife Habitat Conservation; 481 Resource Management Planning.

Wood Utilization: 118 Introduction to Calculus; Physics 111, 112, 113 General Physics; Bot 334 Microtechnique; Bus. Ad. 360 Marketing; For: 342 Wood Gluing; 357 Timber Mechanics; 390 Chemistry of Plant Constituents; 391 Chemistry of Wood Products; 440 Mechanically Derived Products; 441 Sawmilling and Lumbering; 442 Seasoning and Preservation; 443 Utilization Field; 458 Mechanical Properties of Wood.

There is a non-option program offered to a selected number of junior and senior students majoring in forest resources management. Under this program the student is permitted more extensive work in the broader aspects of resource management without choosing any one specific area during the undergraduate years. The number of non-option students is limited to 15 in each of the junior and senior classes. They will be chosen by the faculty from among those requesting the program.

Specific Requirements for Non-option Program:

For: 351 Aerial Photogrammetry; 370 Principles of Wildlife Conservation; 383 Forest Aesthetics; 422-423 Resource Policy and Administration; 484 Hydrologic Principles; plus 15 to 18 additional forestry credits.

MAJOR IN FOREST SCIENCE

This major is for students who wish to prepare for graduate study in some specific area of forest science. It is open only to students who are approved by the Dean of the School of Forestry and maintain a G.P.A. of 2.7 or above.

Specific Requirements for the Forest Science Major:

The core curriculum is required. The remainder of the curriculum consists of courses chosen by the student with the counsel of his advisor and approval of the Dean of the School of Forestry.

BACHELOR OF SCIENCE IN RESOURCE CONSERVATION

This degree meets professional requirements in selected natural resource fields allied to forestry. Major programs are offered in range, recreation, soil, water and wildlife. There is no fixed core curriculum for the BSRC degree, although the first two years of study are almost identical in course content to those required for the BSF. In the third year, the student elects a specific area of study, with a specialized program worked out with the advisor and approved by the faculty.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

50 SLIDE RULE 0 (1-0) prereq Math 117 or concurrent registration. Use of the slide rule in the solution of mathematics problems.

190-191 SURVEY OF FORESTRY 1 (1-0). Enter either quarter. General survey of the field and subject matter of forestry and introduction to the profession; functions and characteristics of forests, their benefits, use, distribution, importance, and conservation.

200 FOREST MENSURATION 6 (4-8) prereq sophomore standing in the School of Forestry. Measurements of timber in the log, the tree, and the stand; growth determination; collection, analysis, and the presentation of field data for volume and yield tables.

210 ELEMENTARY SOILS 4 (3-3) prereq Chem 101-102 or =. An introduction to the chemical, physical, biological, and morphological characteristics of soils.

211 FOREST ECOLOGY 3 (4-4) prereq 210, Bot 225, 250, 265. The individual factors of the environment as they influence the development of plant communities. Emphasis placed on forest communities and the specific problem of recognizing ecology as the basis for forest management practices. Taught during the second five weeks of spring quarter at Lubrecht Forest.

250 FOREST GRAPHICS 2 (1-3). Instruction and practice in the use of drafting tools. Development of drafting techniques. Pictorial and multiview drawings, graphs, charts, map symbols, map area measurements and freehand lettering.

252 SURVEYING 6 (4-8) at Lubrecht Forest, 5 (3-6) on campus prereq Math 117, 116 and For 50. Care, use and adjustment of instruments and equipment. Introduction to differential leveling, transit stadia, plane table surveys, road location and earthworks. U.S. Public Land Survey system. Establishment of horizontal and vertical control. Topographic survey, map construction and solar observations.

290-291 DENDROLOGY 3 (2-3), 2 (1-3) prereq sophomore standing in the School of Forestry or c/i. Identification, classification, silvical characteristics, range and economic importance of the principal forest trees of the United States and Canada. (290) The broadleaf trees. (291) The conifers.

309 FARM FORESTRY 3 (2-4) prereq junior standing in the School of Forestry. The application of the principles of forest mensuration, management, silviculture and soils to small woodland holdings.

311 SILVICULTURAL METHODS 5 (4-4) prereq 211. The production of forest crops including regeneration methods, nursery practices, intermediate cuttings and other cultural operations.

312 SEEDING AND PLANTING 3 (2-4) prereq 311. Artificial reproduction of the forest; collection, extraction, storage, and testing of forest tree seed; direct seeding; nursery practice; forest planting.

331 FOREST FIRE PLANS 3 (3-0) prereq junior standing and 330. Area pre-suppression planning and fire use planning. Action planning on project size fires.

340 WOOD TECHNOLOGY 4 (3-3) prereq 291. Wood identification and anatomy; introducing the relationships of the physical, chemical and mechanical properties to specific uses.

357 TIMBER MECHANICS 3 (2-2). Elementary statics and strength of materials, with particular emphasis upon wood as a structural material.

363 RANGE LIVESTOCK PRODUCTION 2 (2-0) prereq 360 and c/i. Selection, production, and management of range livestock.

FOR UNDERGRADUATES AND GRADUATES

300 FOREST STATISTICS 4 (3-3). The application of statistical methods of forest mensuration.

330 FOREST FIRE MANAGEMENT 3 (3-0). Forest fire prevention, pre-suppression, suppression, and the uses of fire in land management practices. The measurement of fire weather and the factors that influence fire control.

332 FOREST ENTOMOLOGY 3 (2-3) prereq Bot-Zool 111, Bot 250, For 290, 291. Classification, identification, life cycle, injury and control of insects affecting forests and forest products.

341 CHEMICALLY DERIVED WOOD PRODUCTS 3 (3-0) prereq Chem 261 or equivalent and For 340. Generalized chemistry of wood. Survey of chemically derived products and processes including naval stores, pulp, paper and modified woods.

342 WOOD GLUING AND PHYSICAL PROPERTIES 3 (3-0) prereq 340 and junior standing in the School of Forestry. Theory and practice of wood gluing. Familiarization with glues, and glued wood construction. Bent wood, painting and finishing, nail holding capacity, insulation values, and other physical properties.

343 FOREST PRODUCTS AND INDUSTRIES 4 (3-4) prereq junior standing in the School of Forestry. Various types of wood products, both chemically and mechanically derived, their sizes, grades, performance characteristics, and primary conversion industries. By-products and residue utilization. Current trends and problems. (For non-wood utilization majors.)

350 ADVANCED SURVEYING 4 (2-4) prereq 250, 252, Math 116. Route surveys and design, forest transportation, system planning, and selected topics in land surveying.

351 AERIAL PHOTOGRAMMETRY 3 (2-3). The elements of photogrammetry, photogrammetric mensuration, planimetric and topographic mapping, introduction to remote sensing and air photo analysis with emphasis on applications to forestry.

360 GENERAL RANGE MANAGEMENT 4 (3-3) prereq c/i. An introduction to the field of range management, class of stock, grazing season, grazing capacity, control and distribution of livestock on range. Range improvements; forest and range interrelationships.

361 RANGE FORAGE PLANTS 4 (0-8) prereq 360, Bot 366 and c/i. Economic range forage plants; forage value to different kinds of range animals; management problems in their use.

362 RANGE ECOLOGY 3 (2-3) prereq Bot 250. Applied ecology of land use for grazing by domestic livestock and wildlife. The influence of biota, climate, fire, fertilizer, herbicides and mechanical treatments on natural vegetation.

370 PRINCIPLES OF WILDLIFE CONSERVATION 3 (3-0) prereq 360 and c/i. The principles of animal ecology and population dynamics as a basis for the conservation of wild birds and mammals. The social, economic and political framework of wildlife administration. (Not for Wildlife Management Majors.)

380 THE RENEWABLE RESOURCES AND THEIR CONSERVATION 3 (3-0) prereq 210 and Bot 250. The interrelationships of resource conservation problems and programs. Management of their development and use to meet the needs of our expanding economy. Conservation practices and facilities and the agencies involved in their application. (Not open for doctoral credit.)

383 FOREST AESTHETICS 3 (3-0) prereq c/i. Historical development and problems in recreational use of forest and wild lands. Appreciation of natural landscape values. State, national parks and wilderness areas.

385 FOREST RECREATION 4 (3-4) prereq 383. Physical development, objectives and planning in the recreational use of forest and other wild lands.

390 CHEMISTRY OF PLANT CONSTITUENTS. (See Chem 361 and Bot 390.)

391 CHEMISTRY OF WOOD PRODUCTS. (See Chem 367.)

400 FOREST MANAGEMENT 4 (0-8) prereq senior standing in Forestry. Inventory and analysis of a forest property.

401 TIMBER MANAGEMENT 4 (4-0) prereq 311, 420, senior standing in Forestry. Organization and management of forest properties, determination of allowable cut and regulation of the growing stock.

402 FOREST MANAGEMENT 3 (3-0) prereq 400, 401. Organization and writing of a management plan for a forest property.

410 REGIONAL SILVICULTURE 2 (0-Field) prereq 210 and 311. Application of silvicultural methods to the principal commercial forest species, types and regions of the United States.

411 SOIL CHEMISTRY 2 (2-0) prereq 210. The chemical properties of soils, their measurement and influence on growth and distribution of plants.

412 SOIL PHYSICS 2 (2-0) prereq 210. The physical properties of soils, their measurement and influence on growth and distribution of plants.

420-421 FOREST ECONOMICS 3 (3-0) (420) prereq Econ 203. Discussion of the economic characteristics of time in forest resource management and incorporation of time considerations in the evaluation of economic alternatives. (421) prereq 420 or c/i. Economic problems involved in the use of the forest resource and in the distribution of forest products.

422-423 RESOURCE POLICY AND ADMINISTRATION 3 (3-0) prereq c/i. (422) The processes of resource policy formulation and modification. Survey of major public resource policies interpreted in their political contexts. (423) prereq 422. Principles of resource administration. The interrelationship of resource policy to resource administration. Case studies in administrative behavior.

424 FOREST TAXATION 3 (3-0) prereq senior standing or c/i. Systems of forest taxation and their effects on the economic management of forestland resources.

425 INDUSTRIAL FORESTRY 3 (3-0) prereq Econ 203. Economic organization and management of industrial forest properties.

432 BIOLOGY OF FOREST INSECTS 3 (3-0) prereq Zool 113. Fundamentals of taxonomy, morphology, structures, and systems of forest insects, with an elementary consideration of their ecology. (Also see Zool.)

433 FOREST INSECT ECOLOGY 3 (2-3) prereq 432. Consideration of insect physiology and genetics in the study of forest insect population phenomena, principles of control, and the role of the insects in the forest ecosystem, principles of biological control. (Also see Zool.)

440 MECHANICALLY DERIVED WOOD PRODUCTS 3 (3-0) prereq junior standing in the School of Forestry. History, status and developments in residue utilization. Relationships between utilization and timber production. Major uses of wood in the round form. Primary and secondary manufacturing processes and products. Minor forest products.

441 SAWMILLING AND LUMBERING 3 (2-4) prereq junior standing in the School of Forestry. Various types of sawmill and planer operations, their organization and equipment. Lumber grades and uses. By-products and residue utilization. Past and present day trends and problems. Brief survey of drying operations.

442 SEASONING AND PRESERVATION 3 (3-0) prereq junior standing in the School of Forestry. Principles involved in seasoning and preservation treatments of woods. Related wood anatomy. Application to present commercial practices.

443 UTILIZATION (FIELD) V prereq junior standing utilization major. Several weekend trips to study and observe full scale wood products industries on location.

451 AIR PHOTO ANALYSIS 4 (1-6) prereq 351 and c/i. Analytical photo interpretation, terrain analysis, cover classification, and map compilation.

452 LOGGING 3 (3-0) prereq Econ 202. Production-cost analysis; methods of work simplification and materials handling; fundamentals of logging plans.

453 FOREST ENGINEERING 5 (4-2) prereq 252. Forest transportation systems, planning, location and design. (For nonforest engineering majors.)

454-455-456 FOREST ENGINEERING 3 (3-0) S 3 (2-2) prereq 350, 454 and 455 are for forest engineering majors only. (454) Transportation planning and development in relation to resource use. (455) Methods used in estimating construction and transportation costs. (456) prereq 453 or 455. Application of forest and engineering methods, time and cost studies.

457 TIMBER DESIGN 3 (1-4) prereq 357 and Math 151. The design of wood structural components; the use of timber connectors in structural design.

458 MECHANICAL PROPERTIES OF WOOD 3 (1-4) prereq 340, 357. The characteristics of wood as they relate to mechanical properties; wood materials testing.

460 RANGE TECHNIQUES 4 (2-6) prereq 360 and c/i. Range surveys, condition and trend analysis, utilization analysis, damage appraisal. Field trips.

461 RANGE LIVESTOCK NUTRITION 5 (3-4) prereq 360 and c/i. The elements of animal nutrition. The nutritional characteristics of range forage plants. The nutritional requirements of livestock and big game animals.

463 RANGE ECONOMICS 3 (3-0) prereq 360, Econ 201 and c/i. Range regions from an economic standpoint. Range value and income, tenure, taxation, fees and leases, economic utilization of forage, economics of range improvements, ranch organization.

464 RANGE ADMINISTRATION 2 (2-0) prereq 360 and c/i. Legislation and policies developed in the acquisition of federal, state and private range properties. Administration, organization and methods for regulation of grazing on public lands.

465 REGIONAL RANGE MANAGEMENT 6 prereq 363, 460, 461 and c/i. Regional range management problems and situations. Work done on senior spring trip.

470 **ADVANCED WILDLIFE CONSERVATION** 5 (4-2) prereq 370, Zool 308, 309 or c/i. The application of knowledge of the biology of wild birds and mammals, and man's relations to wildlife, to the principles and practice of wildlife conservation.

471 **BIG GAME CONSERVATION** 3 (2-field trips) prereq 360 or c/i. The biology of big game mammals and its application to problems of conservation and administration. Includes field trips to major big game winter ranges.

472 **WILDLIFE HABITAT CONSERVATION** 5 (4-field trips) prereq 470 and c/i. Principles and techniques of assessment of wildlife population responses to ecological change. Relations of land-use patterns to wildlife ecology.

480 **INTEGRATED FOREST RESOURCE MANAGEMENT** 4 (3-2) prereq c/i. Diagnosis of problems, analysis of alternatives and use of the decision making process in the management of renewable resources; the physical, economic, social and political problems involved in integrated resource administration.

481 **RESOURCE MANAGEMENT PLANNING** 4 (4-0) prereq c/i. A detailed study of resource conservation in an analytical structure that defines the effects of various economic and institutional influences on the planning, management, and utilization of natural resources.

482 **SOIL AND WATER CONSERVATION** 4 (3-4) prereq c/i. Principles and methods of soil and water conservation related to soil type, condition, land use, and ownership. Analysis of field problems in land use planning and application for soil and water conservation.

483 **PARK MANAGEMENT** 3 (3-0) prereq 383, 385 and c/i. Theory, evolution and concepts in park system development in the United States, state, national and local levels. Analysis of recreation land management problems in park and forest.

484 **HYDROLOGIC PRINCIPLES** 3 (2-4) prereq c/i. The hydrologic cycle: geologic controls, meteorologic controls, surface runoff and ground water recharge, movement and discharge.

485 **WATERSHED MANAGEMENT** 3 (2-4) prereq 484. Methods and effectiveness of land management on water yield from natural watersheds.

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.

490 **FOREST METEOROLOGY** 4 (4-0). The basic meteorological factors that influence forest fire behavior. The physical meteorological concepts that are associated with forestry problems.

491-492-493 **SENIOR WILDLIFE SEMINAR** 1 prereq senior standing in Wildlife Biology or Forestry. Reports and discussion by students, faculty, and guest speakers on current topics in Wildlife Biology. (Double-listed as Zoology 491-492-493.)

499 **FORESTRY PROBLEMS V** prereq completion of basic undergraduate work and c/i. Individual problem work. Offered by different instructors under various titles.

FOR GRADUATES

500 **ADVANCED FOREST MANAGEMENT** 3 prereq 401, 420 and 421. Analysis of forest management problems by regions and forest types.

502 **ADVANCED MENSURATION** 3. The use and analysis of new mensurational techniques and equipment. The application of special mensurational techniques to forest research.

511 **ADVANCED SILVICULTURE** 3 (2-2) prereq 311 and c/i. Analysis of silvicultural problems in selected forest types.

520 **ADMINISTRATIVE LEADERSHIP** Extension course V prereq undergraduate degree from a college or university of recognized standing or consent of the Dean of the School of Forestry based on applicants' experience and competence. Intensive instruction in the fundamentals of sociology, psychology, speech, writing, business administration, public relations and related fields. One month, 30 hours per week. Staff of university specialists in fields involved.

521-522-523 **ADVANCED FOREST ECONOMICS, VALUATION AND RESOURCE ECONOMICS** 3 (3-0) prereq 420-1. (521) Economic basis for multi-product management of forest industries and forestland resources. (522) Valuation and financial management of forest industries and forestland resources. (523) Economic definition and historical analysis of forest industries and forest land resources.

524-525-526 **RESOURCE POLICY SEMINAR** 3 prereq c/i. A working seminar using the case method in resource problem analysis. (524) Problem identification and analysis. (525) Operating unit analysis. (526) Problems in multiple use.

530 **FOREST FIRE BEHAVIOR** 3 (3-0) prereq 330, 490. The forest fire as a three dimensional problem involving fuels, topography, weather and the influence of these on behavior of wild and prescribed fire. Emphasis is placed on high intensity fires and erratic fire behavior.

531 **FOREST FIRE INFLUENCES** 3 (3-0). The effects of wild and prescribed fire and its influence on plant succession, forest regeneration, and the microclimate of the forest.

542 **WOOD RESIDUE UTILIZATION** 4 (2-8) Prereq 341, 440, 441. Techniques for volumetric survey. Classification and product uses for various types with detailed emphasis on the type most pertinent to interests of student concerned.

543 **WOOD RECONSTITUTED BOARDS** 3 (1-8) prereq 342, 440, 441, 458. Different types of boards with properties and uses of each. Raw materials, additives, production variables and product testing. Laboratory practice in making and testing sample boards.

551 **ADVANCED AIR PHOTO ANALYSIS** 3 (1-3) prereq 451, c/i. Analysis of the problems involved in the use of remote sensing media. Evaluation of these media as sources of resource information.

560 **ADVANCED RANGE MANAGEMENT** 3 prereq 360 and 460. Analysis of range management problems by regions and forage types.

561 **ECOLOGICAL ANALYSIS AND INVENTORY OF LAND RESOURCES** 2 (2-0). Methods of collection and analysis of land resource data on an ecological basis. Emphasis will be on presentation of the inherent characteristics of climate, vegetation and soils. Variability, modification and limitations of resource elements will be considered. Existing systems of resource classification will be evaluated. A model system will be developed.

570 **WILDLIFE SEMINAR** 1 (1-0). Analysis of selected problems in wildlife biology and conservation.

585 **ADVANCED FOREST RECREATION** 3 (3-0) prereq 385. Forest recreational land inventory, analysis and design, methods and planning. The factors involved in irregular sites, roadside planning. Theory, policy and problems in recreational land management. Individual research.

591-592 **RESEARCH METHODS** 3 prereq one course in statistics or statistical elements of forest measurement and c/i. Enter either quarter. (591) The nature of scientific research, planning research projects, organization and presentation of research results. (592) Application of statistical methods to the design of forestry research, techniques of analysis of research data.

598 **SEMINAR** 1. Presentation by students and staff of papers in their field of specialization.

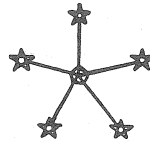
599 **FORESTRY PROBLEMS V**. Individual problem course offered by different instructors under various titles.

600 **RESEARCH V**. Independent research. The type of problem will be identified for forestry majors as follows: Management, Silviculture, Soils, Economics, Fire Control, Utilization, Engineering, Range Management, Wildlife Management, Recreation, Conservation and Protection or General.

699 **THESIS** V R-15.

GENERAL COURSES

are offered as surveys or introductions to broad fields of learning, but there is no "general course" in which a degree is offered. Any University student is compelled to study in many fields as a matter of general education; and specialization in one curriculum, although required for a degree is strictly limited (see Graduation Requirements). But it has been found advisable to provide certain degree-curricula which overlap two or more of the curricula described in other pages of the catalog and in which the specialized instruction is drawn from several fields. The curricula in Biology, Liberal Arts, Pre-Medical Science and Wildlife Biology are examples. It also has been found desirable to provide particular courses which overlap two or more fields; these are described below:



HUMANITIES

FOR UNDERGRADUATES

151-152-153 **INTRODUCTION TO THE HUMANITIES** 3. Enter any quarter. English majors who have completed 9 or more credits in literature may not receive credit in this course. A general survey of the field of Humanities through the centuries from the Greeks to Americans, with the primary aims of understanding and appreciation.

160 (161) **CLASSICAL MYTHOLOGY**. (See Foreign Languages.)

220 (221) **FOREIGN LITERATURES IN TRANSLATION**. (See Foreign Languages.)

341 **THE FILM** 3. An historical survey of the film with appreciation of techniques. (Given under auspices of the School of Journalism and the departments of English and Drama.)

FOR UNDERGRADUATES AND GRADUATES

351 **STUDIES IN HUMANITIES** 3 R-9 prereq Gen 151-152-153. Advanced studies in Humanities. Given by different instructors under various titles.

440 **STUDIES IN COMPARATIVE LITERATURE** 3. The origins and dissemination of important literary ideas, trends, and movements.

451 SEMINAR IN THE HUMANITIES 3 R-9 prereq Humanities 351 or c/i. Specialized topics or areas such as Chinese and Japanese literature. Taught by various instructors from departments in the Humanities Group. Topics announced in class schedules.

SCIENCE

FOR UNDERGRADUATES

125-126-127 SCIENCE FOR ELEMENTARY TEACHERS 5 (4-2). Open only to majors in Elementary Education. (125) A survey of the fundamental aspects of physical science, including force and motion, electricity, magnetism, wave motion, gravity, heat, states of matter, the universe, geological processes, atomic structure, and related topics. (126) An investigation of the interrelationships of physical and biological sciences: the elements, chemical reactions, basic organic chemistry, biochemistry, metabolism, cell structure, relationship of cell structure and function, cell division, basic genetics, origin of life, and related topics. (127) A survey of the animal and plant kingdoms, including taxonomy, morphology, physiology, life cycles, ecology, evolution, and related topics.

131 INTRODUCTION TO BIOLOGICAL SCIENCE 4 (3-2). An introduction to the basic principles of biology, including aspects of cytology, cellular metabolism, genetics, origin of life, mechanics of evolution and adaptation. Offered by the departments of Botany, Microbiology and Zoology. Primarily for students not majoring in Botany, Microbiology, or Zoology. Credit not allowed for this course and Botany or Zoology 111.

132 EVOLUTION, GENETICS AND MAN 3 prereq Gen. 131 or =. An introduction to the study of evolution, especially as related to man and including evidence, mechanisms, genetic nature of hereditary material and adaptation. Not counted toward a major in Botany, Microbiology or Zoology.

FOR UNDERGRADUATES AND GRADUATES

300 CONSERVATION OF NATURAL AND HUMAN RESOURCES IN MONTANA 3 prereq c/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.

322 METHODS OF TEACHING BIOLOGY 3 (2-4) prereq senior or graduate standing. Designed to familiarize prospective high school biology teachers with texts, demonstrations and laboratory experiments used in contemporary approaches to teaching of biology.

GENERAL LITERATURE

FOR UNDERGRADUATES

101-102-103 INTRODUCTION TO THE READING OF LITERATURE 3. Enter any quarter. (101) Fiction. (102) Drama. (103) Poetry. (May be substituted for English 150 on recommendation of the Director of Composition. Not applicable to Group IV requirements.)

FOR UNDERGRADUATES AND GRADUATES

307-308-309 THE DRAMA. (See English.)

344 THEORIES OF DRAMA. (See English.)

INTRODUCTION TO LINGUISTICS 3. A survey of linguistic science, nature of language and the techniques of the descriptive linguist. (See English.)

491-492-493 LITERARY CRITICISM. (See English.)

GEOGRAPHY

is concerned with the description and analysis of the earth's surface. Geographers study and describe the location and distribution of physical and human elements as well as the associations between these various elements. A crucial part of geography is the achievement of an understanding of the processes involved in, the reasons for, and the significance of distributions of physical and human phenomena. Geography, therefore, entails the study of such physical elements as terrain, climate, natural vegetation, soils and water, as well as the human elements which include population, settlements, cultural levels, economic activities and political groupings.

Geography provides the basis for a better understanding



of the world in which we live and of the events which take place around us. Employment opportunities for those trained in geography exist in government, business and industry, and in the teaching profession at all levels.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN GEOGRAPHY. 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 Geography: a minimum of 50 credits in Geography including Geography 101, 102, 201, 211, 300, 360, 370, 380, 390, and one of four Geography courses 331, 335, 345, and 405; Economics 201-202-203; Geology 110; History 261-262 or Political Science 201-202; and Sociology 101 or Anthropology 152.

The following courses with the consent of the advisor may be counted toward a major in Geography: Botany 250 or 355, Business Administration 344, Economics 380, Physics 131-132, Geology 310, Sociology 304, and Forestry 380.

The foreign language requirement listed earlier in the catalog must be satisfied; French or German are strongly recommended unless the student intends to specialize in a part of the world where the use of some other language prevails.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101 PHYSICAL ELEMENTS OF GEOGRAPHY 5. Content and methodology of geography, with emphasis on the earth and planetary relations, maps, climate, vegetation, and landforms.

102 INTRODUCTORY HUMAN GEOGRAPHY 5. The study of man and his works. An analysis of the cultural features of the world's landscapes in relation to human occupation of the earth.

103-104-105 WORLD GEOGRAPHY 2. Enter any quarter. The peoples and places of the world today. Place-to-place differences in the quality of human life and landscape. (103) The Americas; (104) Europe, U.S.S.R., and Africa; (105) Asia, Australia, and Oceania.

201 MAP INTERPRETATION 3 prereq 101 and c/i. Map and chart evaluation. The analysis of human and physical features on maps; progress, coverage, and quality of world mapping.

211 ECONOMIC GEOGRAPHY 5. Distribution of economic activities with emphasis on location factors.

380 CARTOGRAPHY 3 prereq c/i. The interpretation, construction, and uses of important map projections. Cartographic techniques utilized in the presentation of data.

390 FIELD GEOGRAPHY 3 prereq c/i. Fundamental techniques of geographic field research, including observation and recording of environmental data, land use mapping, urban classification, and interviewing and report writing.

FOR UNDERGRADUATES AND GRADUATES

300 GEOGRAPHY OF NORTH AMERICA 3 prereq 101 or =. An analysis of the cultural areas of Canada and the United States with emphasis on differences in regional development.

301-302 PHYSIOGRAPHY OF NORTH AMERICA 3 prereq 101 or =. Enter either quarter. The geomorphic regions of the continent. (301) Eastern North America. (302) Western North America.

303 GENERAL GEOGRAPHY 3. Description and analysis of basic relationships between physical and human elements in geography. Not for geography majors.

305 GEOGRAPHY OF EUROPE 3 prereq 101 or =. The distribution and analysis of geographic features. Contemporary problems and developments.

310 GEOGRAPHY OF SOUTH AMERICA 3 prereq 101 or =. The physical and cultural backgrounds to problems of the South American republics.

311 GEOGRAPHY OF CENTRAL AMERICA, MEXICO AND THE CARIBBEAN 3 prereq 101 or =. Analysis of physical geography and cultural backgrounds in the light of current developments and problems.

312 GEOGRAPHY OF AFRICA 3 prereq 101 or =. Regional differentiation and political and economic development of the whole continent.

315 GEOGRAPHY OF THE FAR EAST 3 prereq 101 or =. The lands and peoples of monsoon Asia interpreted on the basis of economic activities with special reference to population problems.

318 GEOGRAPHY OF THE U.S.S.R. 3 prereq 101 or =. The geographic regions which are the basis for Soviet agriculture and industry.

319 GEOGRAPHY OF MONTANA 3. An analysis of regional differences within the state.

320 GEOGRAPHY OF THE PACIFIC NORTHWEST 3 prereq 101 or =. The physical environment and human geography of the northwestern United States.

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.

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

345 URBAN GEOGRAPHY 3 prereq 101 or =. The growth, morphology, and functions of towns and cities. Examination of the contemporary urban scene.

360 CLIMATOLOGY 5 prereq 101 or =. Elements and controls of weather and climate. Classification and distribution of climatic types.

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

371 PHYSICAL GEOGRAPHY OF ARID LANDS 3 prereq 101, Geol 110 or =. Landform development in the desert environment.

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

405 THE HISTORY OF GEOGRAPHY 3 prereq 12 credits in Geography or =. Geography from early Greek and Roman times to the close of the nineteenth century.

410 PROBLEMS IN GEOGRAPHY V 1-2 R-6 prereq 12 credits in Geography.

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

415 ADVANCED REGIONAL GEOGRAPHY 3 prereq c/i. Analysis in depth of a specific area.

420 ADVANCED CULTURAL GEOGRAPHY 3 prereq c/i. Specialized aspects of Cultural Geography.

450 SEMINAR IN GEOGRAPHY V R-6 prereq 16 credits in Geography including 101, or =.

FOR GRADUATES

500 MODERN GEOGRAPHIC THOUGHT 3. The analysis of geographical concepts, approaches, and techniques developed in the twentieth century.

530 SEMINAR IN CULTURAL GEOGRAPHY 3 R-6 prereq c/i. Analysis of concepts, methodology, and research in cultural aspects of Geography. Topics vary.

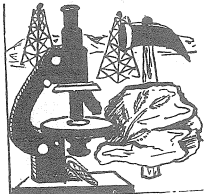
570 SEMINAR IN PHYSICAL GEOGRAPHY 3 R-6 prereq c/i. Analysis of concepts, methodology, and research in physical aspects of Geography. Topics vary.

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.

GEOLOGY

is the study of the earth, the processes by which it is changed, and the history of its development. Geology aids in the location and exploitation of minerals and fuels, soils, building material, water, and other natural resources.



The Bachelor of Arts degree, the Master of Arts (or Master of Science), and the Ph.D. degrees are offered (see Graduate School). Instruction involves the use of mineral, rock and fossil collections, geologic and topographic maps, aerial photographs, optical and chemical methods, X-ray methods, geophysical methods and many others. Nearly all courses include field work. Students are trained in mapping methods and general field investigation under actual working conditions. Such studies are accompanied by theoretical work as well as courses in other basic sciences.

Petroleum companies, governmental agencies such as federal and state geological surveys, and mining companies are the chief employers of geologists.

Petroleum companies, governmental agencies such as federal and state geological surveys, and mining companies are the chief employers of geologists.

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

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN GEOLOGY. In addition to the general requirements for graduation listed earlier in the catalog the following requirements must be completed for the Geology curriculum: Geology 110, 120, 130, 200, 202, 203, 310 (or Geography 370 with consent of advisor), 311-312, 315, 429, 3 credits of 325, 330-331. Also required are Mathematics 116, 117, 118, or Mathematics 121, 118; Chemistry 121-122-123, 245; Physics 111-112-113 or 221-222-223; English 450; Zoology 111, 112. A foreign language, 23 credits in one language, or 3 quarters in each of two languages, or a reading knowledge, is required. French, German, Russian or Spanish is recommended.

Departmental requirements can be waived for students who at the end of any complete year have a B average in all college courses previously taken while pursuing a standard geology curriculum. A special geology curriculum may be devised for these students in consultation with their advisors. This will, for example, allow special curricula planned for special areas of interests as geochemistry, geophysics or paleontology. This is applicable at the end of the freshman year and to transfer students, and can be revoked if the grade average falls below B.

The grade of "P" or "F" is given for all work in Geology 590, 595, 600, and 699.

FIELD TRIP EXPENSES. Students enrolled in courses which include field trips share equally the cost of transportation. Students should consult the University Business Office or at the Department of Geology office for a statement of expenses connected with Geology 429, Field Geology.

SUGGESTED CURRICULUM IN GEOLOGY

Freshman Year

	A Cr.	W Cr.	S Cr.
Engl 150			3
Chem 121-122-123	5	5	5
Geol 110, 120, 130	5	4	3
Group III or IV courses	6	7	5
H&PE 100	1	1	1
	17	17	17

Sophomore Year

Engl 250	3		
Math 116, 117, 118	5	5	5
Geol 200, 202, 203	4	4	4
Zool 111, 112	5	5	
Chem 245			5
Group III or IV courses or electives		2	2
H&PE 100	1	1	1
	18	17	17

Summer Session

Geol 429—3 credits—Summer Field Camp

Junior Year

Engl 350	3		
Physics 111-112-113 or 221-222-223	5	5	5
Geol 311-312, 315	4	4	4
For Lang 101-102-103	5	5	5
Group III or IV courses or electives		3	3
		17	17

Senior Year

Geol 330-331	3	3	
Geol 310			3
Geol 325			3
For Lang 211-212	4	4	
Engl 450	3		
Electives	7	10	10
	17	17	16

Analysis of Requirements

	Cr.
1. University requirements (Engl 9 cr.; Group III 12-15 crs.; Group IV 12-15 crs.; For Lang 23 crs.)	56
2. Geology academic year course requirements	48
3. Other departmental requirements (Math 15 cr.; Chem 20 crs.; Physics 15 crs.; Zool 10 crs.; Engl 3 cr.)	63
4. Health and Physical Education	6
5. Electives	13
	186
6. Geology summer field camp (between Soph-Jr years)	8

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

*Courses offered alternate years.

101 INTRODUCTION TO GEOLOGY 4 (2-4). Description and theories of the origin of the universe and solar system; origin of the elements; energy and time in geology; the gross aspects of the crust and interior of the earth; description and origin of minerals and rocks. 101-102-103 not open to geology majors.

102 INTRODUCTION TO GEOLOGY 4 (2-4) prereq 101. Metamorphism and the origin of mountains; paleomagnetism and continental drift; the major features of development and principles of the time scale; the ideas of evolution.

103 INTRODUCTION TO GEOLOGY 4 (2-4) prereq 102. Development of North America during the Paleozoic, Mesozoic and Cenozoic eras; erosional processes of the earth's surface, earth-moon system; economic resources; geology as a science.

110 PHYSICAL GEOLOGY 5 (3-4). Open to all students. Minerals, rocks, and structure of the earth's crust; the dynamic processes, volcanism, diastrophism, and gradation which shape the earth's landscape. Credit not allowed for 110 and 101-102-103.

120 INTRODUCTION TO GEOLOGIC MAPS AND AERIAL PHOTOS 4 (2-4) prereq 103 or 110. Interpretation of geologic maps. Geologic features in aerial photos. Elements of photogrammetry. Geologic illustration.

130 FIELD METHODS 3 (1-4) prereq 120. Field techniques including plane table mapping, use of Brunton compass, altimeter, Jacob staff, measurement and description of stratigraphic sections, and geologic mapping on aerial photos and topographic base maps. Some all-day field trips on Saturday.

200 GENERAL PALEONTOLOGY 4 (3-2) prereq 103 or 110. General principles of paleontology, evolution, and history of plants and animals.

202 PRINCIPLES OF STRATIGRAPHY 4 (3-2) prereq 200. Stratigraphic methods and principles. Examples drawn mostly from North American stratigraphic successions.

203. HISTORICAL GEOLOGY 4 (3-2) prereq 202. The origin of the earth. Precambrian, Paleozoic, Mesozoic and Tertiary history.

210 INTRODUCTION TO ROCKS AND MINERALS 4 (2-4) prereq 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.)

310 GEOMORPHOLOGY 3 (2-2) prereq 120. Landforms in terms of the processes which create them. The basic processes of physical geology. Emphasis on modern concepts.

311-312 MINERALOGY 4 (2-6) prereq Chem 121 and Math 116. Elements of crystallography; origin, classification and determination of common minerals by physical (including optical) and chemical methods; special emphasis on ore and rock forming minerals.

315 PETROLOGY 4 (2-6) prereq 312. Common rocks, their mineral composition and physical characteristics, classification, identification in the field, origin and structural features.

325 PROBLEMS V prereq 30 cr. in Geology or = and c/i. Supervised investigation in any phase of geologic study in which the student has sufficient background to contribute original thought.

330-331 STRUCTURAL GEOLOGY 3 (2-4) prereq 203, Math 118, Physics 113 or 223 or concurrent registration. Structural features of earth's crust; their analysis by geometric and stereographic projections. Mechanical principles of deformation.

350 *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.

429 FIELD GEOLOGY Su 8 prereq 130, 203. Given by Indiana University Geology Department staff at their field station near Whitehall, Montana. Geologic training applied to detailed and regional field geology. Includes measuring and describing sections, mapping on aerial photographs and topographic base maps, interpreting geological data. Trips to Dillon region of Southwest Montana and to Glacier National Park. Registration must be completed by April 1.

FOR UNDERGRADUATES AND GRADUATES

300 GEOLOGY FOR NATURAL SCIENCE TEACHERS 4 (3-2) prereq c/i. Primarily for teachers of Natural Science. General physical geology including minerals, rocks, erosion by streams and glaciers, action of volcanoes, origin of earthquakes. Includes field trips. Not allowed toward a degree in geology.

301 GEOLOGY AND MINERAL RESOURCES OF MONTANA 3 (2-3) prereq 300 and c/i. Primarily for teachers of Natural Science. Broad discussion of the geology and evolution of Montana and adjacent areas through the last two billion years. Metallic and non-metallic mineral deposits in and near Montana. Frequent field trips. Not allowed toward a degree in geology.

302 FIELD GEOLOGY FOR NATURAL SCIENCE TEACHERS 3 prereq 300, 301 recommended, c/i. Primarily for teachers of Natural Science. Field observation of rocks, geologic structures, landforms, and selected mineral deposits. Aerial photographs and topographic maps, interpreting geologic data. Five days of on-campus instruction, ten days in the field with evening discussion periods. Enrollment limited to 32 students. Not allowed toward a degree in geology.

306 METHODS OF TEACHING EARTH SCIENCE 3 (2-4) prereq 203 or 210. Contemporary texts, demonstration techniques, laboratory experiments, and field procedures needed in developing an earth science curriculum. (Credit not allowed toward a degree in geology. Course does not satisfy group requirements.)

408 (308) INTRODUCTION TO VERTEBRATE PALEONTOLOGY 4 (2-4) prereq 200 or =. Principles of vertebrate paleontology, vertebrate evolution; comparative laboratory examination of representative fish, amphibians, reptiles, mammals and birds.

410-411 *INVERTEBRATE PALEONTOLOGY 4 (2-4) prereq 110, 200 or Zool 111, 112 or concurrent registration. (410) Principles of biostratigraphy with examples taken chiefly from the arthropods, brachiopods, and coelenterates. (411) Principles of paleoecology with examples taken chiefly from the mollusks and echinoderms. Labs include paleontologic techniques.

412 *MICROPALEONTOLOGY 3 (2-2) prereq 203 or Zool 111, 112. Morphology, classification and biostratigraphic associations of major animal and plant microfossil groups.

420 OPTICAL MINERALOGY 4 (2-6) prereq 315, Physics 113, or 223, and Math 116. Theory and use of polarizing microscope in identification of non-opaque mineral fragments and minerals in thin section.

425-426 PETROGRAPHY/PETROLOGY 4 (2-6) prereq 315, 420. (425) Descriptive and interpretative study in thin section of igneous minerals and rocks. (426) Similarly treats metamorphic rocks. Advanced petrologic considerations included in both quarters.

427-428 GEOCHEMISTRY 3 (3-0) prereq 315, Chem 123. (427) Origin of the elements. Distribution of the elements in the cosmos, earth, and earth's crust. Principles of inorganic and crystal chemistry applied to silicate minerals. (428) Description and explanation of the distribution of elements in igneous and metamorphic rock units. Solution chemistry as applied to sedimentary deposits with emphasis on chemical precipitates.

432 SEDIMENTATION 4 (3-2) prereq 110, 315. Interpretation of depositional environments using both sedimentary structures and grain size and shape analysis; labs include statistical techniques and field trips.

440 INTRODUCTION TO GEOPHYSICS 3 (3-0) prereq Physics 113, or 223, Math 118 or concurrent registration, Geol 331. Theory of commonly applied geophysical methods, including gravimetric, magnetic, seismic, electric and radiometric; emphasis on the interrelationships of geophysical anomalies and geologic structure. Geophysical case histories.

445 X-RAY ANALYSIS 3 (2-2) prereq Physics 223. Theory of x-rays; their use in the identification of polycrystalline materials using powder camera and diffractometer methods.

450 *PETROLEUM GEOLOGY 3 (2-2) prereq 203, 331. Principles of petroleum genesis and accumulation. Nature and genesis of petroleum reservoirs. Applications of paleontology and stratigraphy to petroleum exploration. Principles and uses of geophysical logs.

451 GROUND WATER GEOLOGY 4 (3-2) prereq 203, 315, Physics 113 or 223. Geologic and hydrologic conditions controlling occurrence and development of ground water.

460 *HISTORY OF GEOLOGY 2 (2-0) prereq junior standing with major in one of the physical sciences. Historical and philosophical analysis of the development of geology and related sciences from their beginnings to the 20th century.

FOR GRADUATES

500 *SEDIMENTARY PETROLOGY 4 (2-4) prereq 420, 540. Composition and classification of terrigenous sedimentary rocks and interpretation of their provenance, transport and tectonic setting from thin section examination.

505 *ADVANCED GEOCHEMISTRY 3 (3-0) prereq 428. Application of physical chemistry to study of origin, internal structure and chemical composition of earth.

507 *CARBONATE PETROLOGY 4 (2-4) prereq 420, 540. Description, classification and environmental interpretation of carbonate rocks chiefly from thin section examination.

510 *GEOTECTONICS 3 (3-0) prereq 331. Analysis, synthesis of regional structural features including geosynclines, island arcs, compressional mountain systems, structure of plateaus, and broad warps. Conditions within earth; possible causes of deformation.

511-512 *METALLIC MINERAL DEPOSITS 4 (3-2) prereq 203, 315, 331. Theoretical and descriptive aspects of nature, origin, classification and geologic environments of metallic mineral deposits; field trips.

513 *NON-METALLIC MINERAL DEPOSITS 4 (3-2) prereq 203, 315, 331. Descriptive and theoretical aspects of the origin, distribution, classification and use of non-metallic deposits of building and chemical materials; emphasis on geochemistry and tectonics of localization of ore; field trips.

514 *GEOLOGY OF SOLID FUELS 3 (2-2) prereq 213, 315, 331. Descriptive and theoretical aspects of the nature, origin, distribution and classification of coal and radioactive materials. Depositional environment of coal and subsequent biochemical and dynamochemical changes. Mineralogy and geology of radioactive materials. Occasional field trips.

515 *STRUCTURE OF MINERAL DEPOSITS 3 (3-0) prereq 331. 512, 513 recommended. Classification of mineral deposits according to structural environment and features; special reference to origin as related to tectonic control.

520 *PETROGENESIS 3 (3-0) prereq 426 and 428. Advanced discussion of modern theories of origin of igneous and metamorphic rocks.

522 *STRUCTURAL ANALYSIS 3 (2-2) prereq 315, 331. Study and interpretation of the fabric of naturally deformed rocks. Analysis of tectonites on all scales, including geologic map, hand specimen and thin section.

525 *MICROSCOPIC DETERMINATION OF OPAQUE MINERALS 3 (1-4) prereq 420, 512. Identification of minerals in polished sections by physical and microchemical tests. Theoretical study of mineral paragenesis and sulfide systems.

528 *X-RAY SPECTROGRAPHIC CHEMICAL ANALYSIS 2 (0-4) prereq Chem 245, Geol 445. Qualitative and quantitative chemical analysis by x-ray spectrographic techniques. Production and qualitative analysis of secondary x-rays; detectors and pulse height analysis; methods of quantitative analysis. Exercises in instrument operation, qualitative and quantitative analysis.

532 *ADVANCED MINERALOGY 3 (3-0) prereq 315. Detailed study of the crystal chemistry of geologically significant minerals in connection with their physical and chemical properties and genetic implications.

533 *SOLID STATE GEOPHYSICS 3 (3-0) prereq Math 311, Physics 223, Physics 301 recommended. Physical properties of crystalline solids that have particular application to geologic problems.

540 *ADVANCED STRATIGRAPHY 3 (3-2) prereq 130, 331, 410-411. Advanced discussion of modern concepts concerning stratified rocks.

550 PRINCIPLES OF SEISMOLOGY 3 (2-2) prereq 440, Math 311, Physics 472. Elementary elastic wave theory: Analysis of stress and strain, generalized Hooke's law, equations of motion, surface and body waves, reflection and refraction, and instrumentation. Applications to earth physics and exploration.

554 GRAVITY AND HEAT FLOW 3 (2-2) prereq 440, Math 311. Theory instrumentation, field procedures and interpretational methods including computer models; earth shape and dynamic earth processes investigated; applications to local geologic problems. A field problem near Missoula will be conducted.

556 MAGNETIC AND ELECTRICAL FIELDS OF THE EARTH 3 (2-2) prereq 440, Math 311, Physics 222. Earth's natural magnetic and electrical fields described; rock magnetism, instruments, computations, and interpretation; applications to exploration. A field problem near Missoula will be conducted.

564-565-566 *VERTEBRATE PALEONTOLOGY 4 (2-4) prereq 403 or Zool 304 or =. (564) The lower vertebrates. Taxonomy, morphology, paleoecology, and geologic history of fishes, amphibians and reptiles. (565) Taxonomy, morphology and geologic history of mammals. (566) History and paleoecology of mammals and birds.

590 SEMINAR V prereq graduate standing in geology or comparable training in cognate areas and c/i.

595 ADVANCED PROBLEMS V. Investigations of geologic problems exclusive of thesis research.

600 RESEARCH V. Directed research to serve as thesis for graduate degrees.

699 THESIS V R-15. Credit assigned upon submittal of final copy of approved and bound thesis.

programs. Professional activity courses include training in teaching team games, individual and dual sports, gymnastics and tumbling, aquatics, and forms of the dance. Students interested in physical therapy and orthopedic rehabilitation may fulfill entrance requirements for approved schools of physical therapy. Health education includes personal as well as school and community problems and the contributions of various agencies to human health and welfare. Recreation courses offer preparation and practice in group leadership, training in crafts and social activity skills for leaders of youth groups, and background for careers in industrial and community recreation and in recreation therapy. All levels of American Red Cross certification are offered in conjunction with swimming and first aid courses.

Many graduates enter the teaching profession. Some choose to continue graduate studies with specialization in physical education, coaching, the dance, physical therapy, or recreation therapy. Others become field directors for the American Red Cross in the areas of first aid, life saving and water safety. Many elect careers in leadership positions in youth-serving organizations in playground and recreation centers, in summer camps, in the armed forces, in industrial recreation, and in recreation in hospitals and rehabilitation centers.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HEALTH AND PHYSICAL EDUCATION. Two degrees are offered in this Department: Bachelor of Arts, which requires that the foreign language requirement listed earlier in the catalog be satisfied, and Bachelor of Science, which requires no course in foreign language. Students electing either degree will fulfill the requirements listed below. Upper division students are expected to maintain a cumulative grade-point average of at least 2.0 in order to continue as majors in the department.

General Education (69 crs.): Group I Life Sciences (to include Zool 111 and 202, Micb 102); Group II Physical Sciences or Math (Pre-Physical Therapy to include Chem 101, Physics 111; Health to include Chem 101); Group III Social Sciences (to include Soc 101); Group IV Electives; and in addition English, Home Ec 146, Psych 110 and 230, H&PE 115-120 (6 crs. fulfills H&PE requirement), and Speech 111.

Teacher certification (54 crs.): Required only of students who desire teaching certificate: sequence of courses in Education plus teaching minor.

Professional Physical Education (31 crs.): H&PE 200, 215-220, 290, 365, 380, 385, 399, 465, 478.

AREAS OF SPECIALIZATION (student selects one area for specialized study):

Physical Education, Men: Required (19 crs.): H&PE 339, 358, 361, 373, 375, 386, 490; Electives (13 crs. required): H&PE 211, 240, 311, 326, 460, 238 or 336, maximum of 9 credits from 210, 213, 214, 223, 310, 321, 322.

Physical Education, Women: Required (23 crs.): H&PE 232, 301, 302, 324, 339, 373, 375, 386, 460, 490; Electives (9 crs. required): H&PE 213, 303, 325, 326, 356, 238 or 336, maximum of 3 credits from 361, 362, 363.

Coaching: Required (22 crs.): H&PE 210, 211, 240, 310, 311, 321, 460, 490, plus 2 of following 4 coaching courses 213, 214, 223, 322; Electives (10 crs. required): H&PE 326, 339, 358, 361, 373, 375, 386, one additional coaching course, Educ. 347.

Dance: Required (31 crs.): H&PE 234, 235, 324, 325, 327, 329, 401, 402, 490, Art 125, Drama 131, Music 134; Electives (7 crs. required): H&PE 213, 238, 301, 302, 303, 326, Art 372, Drama 201, 300, 341; Music 111, private lessons.

Health: Required (25 crs.): H&PE 373, 375, 386, 486, Micb 100, 101, 110, plus 2 of following 3 courses in Home Ec 366, 367, 368; Electives (12 crs. required): H&PE 240, 361, 490, 238 or 336, Soc 204, Home Ec 246, SPA 330, Educ 347.

Pre-Physical Therapy: Required (40 crs.): H&PE 240, 386, 388, 390, 460, 486, 585; Math 116, 117, SPA 330; plus 4-5 additional credits in Chemistry or Physics; Electives (38 crs.) to be selected with consent of advisor.

Recreation Leadership: Required (Women 29 crs., Men 30 crs.): H&PE 326, 336, 356, 358, 361, 362, 363, 464, 490, 491; in addition men students also take H&PE 311 and two coaching courses; women students also take H&PE 232 and 2 courses from H&PE 301, 302, 303. Required Cognate Courses: Educ 347; 16 credits elected from Art, Drama, Music, Speech; 8 credits elected from Social Welfare; 7 credits elected from Sociology. Electives: 10 credits required from HPE 301-2-3 (women) or 1 or 2 coaching courses (men), HPE 238, 339, 386.

Suggested first-year program:

	A	W	S
	Cr.	Cr.	Cr.
Engl 150, Psych 110, Speech 111	3	5	5
Group III, Soc 101,	4-5	5	5
Zool 111, Home Ec. 146, Micro 102	5	4	3
Group IV	3	3	3
H&PE 115, 116, 117	1	1	1
	17	18	17

HEALTH AND PHYSICAL EDUCATION

deals primarily with muscular activity and recreation to provide the individual with wholesome psycho-motor and organic development, with fitness for daily living, and with resources for use of leisure. The program provides (1) instruction in a wide variety of sports and recreation skills, (2) opportunity for student groups to organize teams and to participate in formal and informal competition, in such activities as archery, badminton, basketball, bowling, golf, horseshoes, skiing, swimming, tennis, touch football, softball and volleyball, and (3) preparation for professional careers in the various fields related to physical education and recreation.

A student may earn either a Bachelor of Arts degree or a Bachelor of Science degree with a major in this field. The Master of Arts and the Master of Science degrees are also offered.

Theory courses include structure and function of the human body, basic principles and teaching procedures, history and philosophy, and planning and administration of



SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN RECREATION. Two degrees are offered: Bachelor of Arts with major in Recreation which requires that the foreign language requirement listed in the catalog be satisfied, and Bachelor of Science with major in Recreation, which requires no course in foreign language. Students electing either degree will fulfill the requirements listed below. Upper division students are expected to maintain a cumulative grade point average of at least 2.0 in order to continue as majors in the department.

General Education (65 crs.): Group I Life Sciences (to include Zool 111 and 202, Mich 102); Group II Physical Sciences or Math; Group III Social Sciences (to include Soc 101, 202, 206); Group IV Humanities; and in addition English 150, 250, 350; Psych 110 and 230; Speech 111 and 314.

General Professional Preparation (17 crs.): HPE 115 - 120 (6 cr. fulfills H&PE requirement) and HPE 199, 240, 301, 303, 339, 465, 490.

Specialized Professional Preparation (33 crs.): HPE 225, 261, 350, 356, 362, 363, 364, 440, 464.

Requirements from other Departments (30 crs.): Educ 347; For 383, 385; Jour 270; S W 181; Art (4 crs. required) 123, 125, 126, 127, 129, 160; Drama (4 crs. required) 121, 377, 374; Music 134.

Electives: 35 crs. of which no more than 20 crs. may be from H&PE.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 PHYSICAL EDUCATION 1. All students except those exempt for cause are required to complete six quarters of Physical Education 100 in addition to the 180 credits required for graduation. (See Required Courses earlier in the catalog). Only one credit per quarter may be used to meet the requirement. A student may not repeat at the beginning level an activity in which he has previously received a grade of A or B.

Program offerings are divided into 5 groups:

1. **SWIMMING:** Beginning, Intermediate, Advanced.
2. **PHYSICAL FITNESS:** Apparatus, gymnastics, physical conditioning, slim gym, tumbling, weight training.
3. **DANCE:** Folk, Latin American, modern, social, square.
4. **INDIVIDUAL AND DUAL SPORTS:** Archery, badminton, bowling, fencing, golf, handball, judo, recreation sports, riflery, skiing, tennis, track and field, wrestling.
5. **TEAM SPORTS:** Baseball, basketball, field hockey, football, soccer, softball, speedball, volleyball, water polo.

Within the six quarters of P.E. 100, a student is required to complete the following unless exempted by the department.

1. Participate for at least 1 quarter in 2 of the 3 following areas:
 - a. Dance
 - b. Individual and dual sports
 - c. Team sports
2. Electives to fulfill the 6 quarter requirement. Within the 6 credit requirement a maximum of 3 quarters may be taken in one activity.

115-120 PROFESSIONAL ACTIVITIES FOR MAJORS AND MINORS 1. Six quarters required of all H&PE majors and minors in place of PE100.

Men (115) Gym. (116) Wrestling. (117) Badminton, Volley Ball. (118) Soccer, Speed Ball. (119) Weight Training. (120) Swimming.

Women (115) Soccer, Speed Ball. (116) Modern Dance. (117) Soft Ball. (118) Volley Ball, Speed Ball. (119) Gym (120) Track.

199 FIRST AID 2. Red Cross Standard and Advanced courses and Medical Self-Help. Certification may be secured upon completion of course.

200 (190, 198) HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION 3. Historical, philosophical and scientific backgrounds as related to physical education today.

208 ADVANCED COACHING TECHNIQUES 1. Intensive training in special techniques of coaching various sports.

210 COACHING OF FOOTBALL 3.

211 (211, 212) THEORY OF OFFICIATING FOOTBALL 1. Principles, rules and techniques. Includes practical experience.

213 COACHING GYMNASTICS AND TUMBLING 3 prereq 115 (Men), 119 (Women), and c/i. History, values, facilities, equipment, principles, safety methods and devices, warm-up and conditioning, nomenclature, skills, judging, competitive gymnastics.

214 COACHING OF WRESTLING 3 prereq c/i. History, values, principles, warm-up and conditioning, weight divisions, terminology and rules, skills, and officiating.

215-220 ADVANCED PROFESSIONAL PREPARATION FOR MAJORS AND MINORS 1 R-6. Preparation in advanced techniques, theories and practices.

223 (200) COACHING OF BASEBALL 3.

225 RECREATION SPORTS OFFICIATING, THEORY AND PRACTICE 3. Principles, rules, techniques and practical experience in officiating team and individual indoor and outdoor recreational sports. Football and basketball officiating not included.

232 OFFICIATING BASKETBALL (WOMEN) 2. Theory, principles, rules and techniques. Practical experience in officiating intramurals. Ratings given by Women's National Officials Rating Committee upon successful completion of requirements.

234 DANCE HISTORY 3. Dance from its primitive beginning through modern expressions.

235 ACCOMPANIMENT FOR DANCE 2. A survey of music for dance. Improvisational techniques. Percussion, laboratory.

236 THEORY AND PHILOSOPHY OF DANCE 2. A philosophical foundation for dance as related to other arts in historical development and style.

238 WATER SAFETY INSTRUCTOR 2 prereq Red Cross Senior Life Saving Certificate. Instructor's course in life saving and water safety. Red Cross Instructor's Certificate awarded upon successful completion of requirements, providing student has reached his 18th birthday.

240 CARE AND PREVENTION OF ATHLETIC INJURIES 3. Common athletic injuries, their causes, prevention and care. Practical work in bandaging and wrapping.

250 SKI INSTRUCTORS QUALIFICATION PROGRAM 3. Prereq c/i. Open to all students with above average skiing ability. Techniques of Teaching Skiing including finished technical forms, teaching methods, ski school progression, and ski mechanics. Prepares the potential ski instructor for certification by the Professional Ski Instructors of America.

261 (361) INTRODUCTION TO RECREATION 3 prereq Soc 101. Social significance of recreation and leisure; community approach to recreation. Principles and practice concerned with leadership of recreation programs. Credit not allowed for this and for Soc Wel 361.

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. Experience in teaching; class organization, analysis of techniques, development of units of instruction in seasonal sports.

310 COACHING OF BASKETBALL (MEN) 3.

311 (311, 312) THEORY OF OFFICIATING BASKETBALL (MEN) 1. Principles, rules, techniques and practical experience.

321 (321, 322) COACHING OF TRACK 3. Theory and practice in track and field events.

322 COACHING OF COMPETITIVE SWIMMING AND DIVING 3 prereq c/i. Coaching and analysis of competitive strokes and techniques. Development of training program on age group, high school and college level. Officiating and meet management.

324 METHODS AND MATERIALS IN SOCIAL AND LATIN DANCE 2.

325 METHODS AND MATERIALS IN MODERN DANCE 2 prereq 116 (Women).

326 METHODS AND MATERIALS IN FOLK DANCING AND SQUARE DANCING 2.

327 CHILDREN'S DANCE LABORATORY 2 prereq 116 (Women). Creative, rhythmic movement for children. Experience in observing and directing children's dance.

336 AQUATIC PROGRAM MANAGEMENT 3 prereq Senior Life Saving or =. Group methods of teaching swimming for various age groups. Organization and operation of programs in competitive swimming. SCUBA diving, swimming for the handicapped, staging water shows. Swimming pool and waterfront management.

339 TEACHING PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS 3 prereq PE majors and minors, junior standing, PE 200 and 6 credits in 115-120; elementary education majors, junior standing and 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.

350 PROGRAMMING IN RECREATION 3. Principles of program planning for organized offerings in recreation. Selection, adaptation and evaluation of activities. Translation of needs and interests into programs.

352 CAMP COUNSELOR 3. Qualifications and professional preparation for camp counselors. Duties and functions as a group leader; campcraft skills and techniques. Practical applications of techniques.

356 COMMUNITY CENTERS AND PLAYGROUND MANAGEMENT 2 prereq 339. Historical background, construction, equipment, management, problems, methods. Practical experience.

362 RECREATION LEADERSHIP (SOCIAL RECREATION) 3 prereq Soc 101. Principles and practice in group leadership, program skills for various age groups and for special groups, such as the handicapped. Credit not allowed for this and Soc Wel 362.

363 RECREATION LEADERSHIP (CAMP LEADERSHIP) 3 prereq Soc 101. Principles and practice in group leadership of outing activities; skills and understandings essential to organized camping. Credit not allowed for this and Soc Wel 363.

364 FIELD WORK IN RECREATION 2, Su V R-8. Supervisory and leadership experiences, methods and techniques to be used in conducting recreation programs in outdoor recreation, community, social agency and institutional situations. Laboratory given in various activities. Activities are coordinated to outdoor activities of the season and group activities available for leadership training.

365 ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION 3 prereq 200. Principles and policies for the organization and administration of high school physical education departments. Management of the physical plant.

375 (373, 375) METHODS IN TEACHING HEALTH 3 prereq PE major or minor or Educ major. Foundations for teaching health; planning for instruction; methods and techniques in direct, correlated and integrated instruction; material aids and their sources, evaluation in health instruction.

380 APPLIED ANATOMY 3. The bones, muscles and joints of the body. Bodily movements, joint mechanics, and the action of muscles in relation to physical education and activities of daily life.

388 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.

390 CLINICAL TRAINING IN PHYSICAL THERAPY V 1-4 R-4 prereq 386 and c/i. Practical experience in local physical therapy centers.

399 FIRST AID 3. Red Cross Standard, Advanced and Instructor's Courses and Medical Self-Help. Certification at instructor level may be secured from completion of course.

490 TEACHING PHYSICAL EDUCATION ACTIVITIES 2 R-4 prereq 115-120 and c/i. Assigned teaching projects in college classes, under supervision.

FOR UNDERGRADUATES AND GRADUATES

329 ADVANCED TECHNIQUES IN MODERN DANCE 2 prereq c/i. Advanced study of modern dance techniques contributing to flexibility, strength, and control in dance expression.

330 CONDUCT OF TRACK AND FIELD MEETS 2 prereq 321. The Organization, management, supervision and control of track and field meets. Rules and regulations involved. Public relation and publicity factors.

358 THE HIGH SCHOOL INTRAMURAL PROGRAM 2. Problems of organizing and administering the intramural sports in the high school.

373 THE SCHOOL HEALTH PROGRAM 3. Required of Physical Education majors and minors. Function and scope of health services; appraisal, preventive and remedial aspects of common health problems; school and classroom aspects of healthful school living; school safety program.

385 KINESIOLOGY 2 prereq 380. Advanced study of muscle action and joint mechanics of the body.

386 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.

401 DANCE COMPOSITION AND IMPROVISATION 3 prereq c/i. A study of dance composition in relation to form and content. Improvisation as a source of composition. Experience in creative effort.

402 DANCE PRODUCTION 3 prereq 401. Choreography, staging, lighting, makeup, costuming and other problems of dance in public performance including concert dance and dance demonstrations. Performance in dance concert required.

440 RECREATIONAL AREAS AND FACILITIES 3. The planning, construction and maintenance of urban oriented recreation areas and facilities as they relate to organized activities in public and private parks, playgrounds, play areas, all-purpose and specific use camps and day camps. Methods and techniques for financing. Tax programs and possibilities. Federal support programs for area and facility development.

460 SEMINAR V 1-3 R-12. Special problems connected with health, physical education and recreation; reviews of current literature, and topical discussions.

464 ORGANIZATION AND ADMINISTRATION OF RECREATION 3 prereq H&PE (Soc W) 361 or c/i. Personnel, finance, facilities, programs and public relations. Coordination with youth-serving institutional and municipal agencies. (Credit not allowed for this and Soc Wel 464.)

465 MEASUREMENT AND EVALUATION IN PHYSICAL EDUCATION 3. Orientation to testing and measuring, administrative use of tests, elementary statistical techniques and procedures.

466 (366) CURRICULUM CONSTRUCTION 3. Classification and analysis of physical education activities; criteria for selecting activities; construction of program for specific situations.

470 PHYSICAL EDUCATION AND RECREATION FOR THE SPECIAL STUDENT 3 prereq 339, and 361 or Soc W 361. Concepts and activities related to physical activity and leisure time needs of the special child. Laboratory experience in leading games, rhythms and social recreation activities.

478 (378) PHYSIOLOGY OF EXERCISE 3 prereq Zool 202. The physiological effects of the different types of exercise on the functions of the human body.

486 ADVANCED CORRECTIVE PHYSICAL EDUCATION PROCEDURES 3 prereq 386. Survey of orthopedic conditions which fall in province of the corrective physical education and physical therapy specialist; recommended therapeutic procedures; organization of corrective physical education programs in schools and colleges.

491 PRACTICUM IN RECREATION V R-4 prereq 464 and c/i. Supervised field work. Experience in conducting recreation programs in community, social agency, and institution situations.

FOR GRADUATES

501 RESEARCH METHODS 3 prereq or coreq 503 or =. Research methods and techniques used in health, physical education and recreation. Instruction in developing individual studies.

502 RESEARCH IN RECREATION 3. Independent directed research.

503 STATISTICAL MEASUREMENTS IN PHYSICAL EDUCATION 4 prereq 465 or =. Specific tests for evaluation of organic, neuro-muscular, psychological and social outcomes. Practice in construction and application of tests, and interpretation of results.

521-522-523 FOUNDATIONS FOR HEALTH, PHYSICAL EDUCATION AND RECREATION 3 prereq undergraduate major in PE or =. Enter any quarter. (521) Advanced Physiology of Exercise; (522) Psychological-Sociological bases; (523) Philosophical-Historical bases.

531 ADVANCED ADMINISTRATION OF PHYSICAL EDUCATION AND ATHLETICS 3 prereq 365 or =, and c/i. Problems in the administration of high school and college physical education and athletic programs: finance, personnel, public relations.

532 (466) SUPERVISION IN PHYSICAL EDUCATION 3 prereq 365 or =. Roles and responsibilities of supervisors in exerting effective leadership.

535 SEMINAR IN THE ADMINISTRATION OF PUBLIC RECREATION PROGRAMS 3. Problem areas associated with administration of organized recreation, activity programs in municipal, state and national park systems and recreation departments.

536 SEMINAR IN THE ADMINISTRATION OF RECREATION 3. Problem areas in recreation.

537 CURRENT TRENDS IN RECREATION 2. Sociological trends, present patterns of living and their implications in the development of new programs, philosophies and practices in recreation.

541 RECREATION FOR THE AGING 2. Concepts, principles, objectives and methods of recreation for the aging. Emphasis on cardiac problems, rest home programs, the retired, and the impact of increased leisure time and vacations.

575 SPORTS MEDICINE 2 (2-1) prereq 385, 478. The medical aspects of sports and physical training. The etiology and management of injuries, drug use and therapy, nutrition, fatigue, problems of aging and other medical problems associated with participation in sports.

585 ADVANCED KINESIOLOGY 3 prereq 385. Analysis of complex movements, specialized skills, and motor coordination in terms of the mechanics of skeletal and muscular movement.

591 INDEPENDENT STUDY V R-5 prereq c/i. Investigation of problem areas in Physical Education and related fields (exclusive of thesis research).

699 THESIS V R-10.

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 a basis for the pursuit of their chosen profession, but also furnishes knowledge and perspective for intelligent leadership in community affairs.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HISTORY. In addition to the general requirements for graduation listed earlier in the catalog the following special requirements must be completed for the Bachelor of Arts degree with a major in History. A minimum of 50 credits in History is required, with 30 credits from courses numbered over 300 and including History 491 or 492. Only 2 credits in 491 or 492 will count in fulfilling the minimum of 30 upper division credits for the B.A. History majors must elect a minimum of 15 credits in American and 15 credits in European History.

A student may offer a combined major in History and Political Science with 60 credits, of which at least 20 credits must be in History and 20 credits in Political Science. A minimum of 30 credits must be selected from courses numbered over 300.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101-102-103 MODERN EUROPEAN CIVILIZATION 3. Enter any quarter. (101) Europe during the Renaissance, the Reformation, and the Age of Absolutism to 1700. (102) Europe during the Old Regime, the French Revolution, Napoleon, and rise of nationalism to 1850. (103) Europe from 1850 through World War II.

201-202-203 SURVEY OF ANCIENT AND MEDIEVAL HISTORY 2. Enter any quarter. Not open to freshmen. (201) Prehistoric man, the ancient Near Eastern empires, and Classical Greece. (202) The Hellenistic era and the Romans. (203) The barbarian and feudal kingdoms, the Crusades, revival of towns, and trade.

215-216 EUROPE IN THE 19TH CENTURY 3 enter either quarter. (215) The internal political, economic and social development of the European states from 1815-1870. (216) continuation after 1870 to 215.

241-242-243 ENGLISH HISTORY 3 enter any quarter. (241) The political, economic and social history of Great Britain to 1485. (242) From 1485 to 1715. (243) From 1715 to 1902.

261-262 (251-252-263) UNITED STATES HISTORY 4. Enter either quarter. (261) The American nation from its colonial beginnings to the end of Reconstruction. (262) Continuation to the present.

285-286-287 HISPANIC-AMERICAN HISTORY 4. Enter any quarter. (285) The European background; the political and economic development of Spain and Portugal to the foundation of the Latin American colonies. (286) The Spanish and Portuguese colonies; the revolutionary period and the foundation of present day Latin American states. (287) The development of Latin American States in the 19th and 20th centuries.

FOR UNDERGRADUATES AND GRADUATES

301 ANCIENT NEAR EAST 3. Pre-Greek civilizations of Mesopotamia, Asia Minor and Egypt.

302 (303) ANCIENT GREECE 3. Greek culture during the period of the city-states and the Age of Alexander the Great.

303 THE HELLENISTIC AGE 3. The Ptolemaic, Antigonid, Seleucid and lesser states successor to the Alexandrian Empire, and their social, political and economic development to the time of their absorption by Rome.

304 (305) ANCIENT ROME 3. Early 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 1300 to 1500; the impact of this idea on later historiography.

310 THE REFORMATION 3. The impact of the Reformation on European society, politics, economic theory and religious thought from 1500 to 1600.

311-312-313 EARLY MODERN EUROPE 3 Enter any quarter. (311) The political, economic, intellectual, and social development of Europe from 1450 to 1559. (312) 1559 to 1648. (313) 1648 to 1789.

314-315 FRENCH REVOLUTION AND NAPOLEONIC ERA 3 prereq 101 or 312. Enter any quarter. (314) The French Revolution to 1795. (315) The Directory, the rise of Napoleon, the First Empire,

318 THE EARLY TWENTIETH CENTURY (1900-1933) 3 prereq 103. Internal development of Great Britain and the continental powers. International rivalry prior to World War I. The War and its aftermath.

319 CONTEMPORARY EUROPEAN HISTORY 4 prereq 103. The internal affairs and the external relationships of the principal European states since 1933.

320 MEDIEVAL GERMANY 911-1250 3. The Frankish experiment. Emergence and development of Germany under the Saxon, Salian, and Hohenstaufen dynasties with special emphasis on constitutional growth.

321-322 CENTRAL EUROPE 4 prereq 101. (321) The development of the states of Central Europe from early modern times to 1815. (322) Continuation to the present.

324-325-326 HISTORY OF RUSSIA 3 325 prereq to 326. (324) The beginnings of Russia to 1800. (325) Nineteenth and twentieth-century Russia to the fall of the monarchy. (326) The Soviet Union since the Bolshevik Revolution.

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.

330-331-332 EUROPEAN DIPLOMACY 3. Enter any quarter. (330) The diplomacy of the European states from the Congress of Vienna to 1856. (331) From 1856 to World War I. (332) From 1914 to 1939.

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 disintegration 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. (338) Continuation from the 13th to the 15th centuries; the new scientific movement; the decline of the unity of 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.

345-346 ENGLISH CONSTITUTIONAL HISTORY 3 prereq 241-242. (345) English constitutional development to the end of the Middle Ages. (346) Continuation to the present time.

347-348-349 (333, 348) ECONOMIC HISTORY OF EUROPE 3 prereq 2 quarters of Economics. Enter any quarter. (347) The growth of the economies of ancient and medieval Europe to 1500. (348) European economic growth from 1500 to 1850. (349) Continuation since 1850.

351-352 (353) COLONIAL AMERICA 3. (351) The transfer of English civilization to America in the seventeenth century, with attention to the qualities that supported permanent and particular settlements. (352) American civilization from 1689 to the end of the Seven Years War, with focus upon the political, social and economic maturing that prepared the colonies for the revolutionary era.

357-358 HISTORY OF THE SOUTH 3 enter any quarter. (357) The ante-bellum South, with emphasis on Negro slavery. (358) Reconstruction, the "New South," and the South in the 20th century, with special emphasis on the historical development of racial issues.

359 RECENT AMERICAN HISTORY 3. The internal affairs and external relationships of the United States in the 20th century.

360-361-362 SOCIAL AND CULTURAL HISTORY OF THE UNITED STATES 3. Enter any quarter. (360) American culture in the light of leading social, religious, literary and philosophical ideals. (361) Continuation of 360. (362) Continuation of 361.

365-366 (365) NORTH AMERICAN FRONTIERS 3 prereq 262. (365) Spanish, French, English, and American frontiers in 18th century North America. The moving frontier as process and as region. (366) The trans-Mississippi West in the 19th century.

367 (367-368) MONTANA AND THE WEST 3. Political, social, economic, and cultural development of Montana, and its relations with the American west.

369 THE TWENTIETH CENTURY WEST 3. A regional history of the trans-Mississippi West since the end of the frontier period.

370-371-372 (370-371) DIPLOMATIC HISTORY OF THE UNITED STATES 3 prereq 261. (370) American foreign relations and the evolution of an American foreign policy from Washington's time to the close of the Civil War. (371) Continuation from 1865 to 1900. (372) The twentieth century.

373-374-375 (374) AMERICAN ECONOMIC HISTORY 3 prereq 6 credits in Economics. Enter any quarter. (373) to 1815: colonial origins of the American economy; the economic structure of the British Empire; the economics of independence and pre-industrial years; economic theories. (374) 1815-1890: frontier and factory years; economic consequences of the Civil War; rise of Big Business; economic theories. (375) Since 1890: the challenge of a frontierless economy; welfare economics; economic theories.

376-377-378 (376) AMERICAN CONSTITUTIONAL HISTORY 3 prereq 261. (376) The English and colonial background and the Constitutional Convention. (377) The development of the American constitutional system from the founding of the republic to the close of the Civil War. (378) The American constitution during the twentieth century.

380-381 THE FAR EAST 4 enter either quarter. (380) The social, economic, and political institutions, principally of China and Japan, to the middle of the nineteenth century. (381) Continuation to the present time, with some stress upon international politics in the Far East.

392-393-394 HISTORY OF SCIENCE 3. Enter any quarter (392) Scientific thought from pre-Classical times to the age of Thomas Aquinas, stressing the development of scientific ideas within their cultural context; special emphasis upon the transfer of the rationalist doctrines of the early Greeks to the civilization of Western Europe. (393) Scientific thought from the Renaissance through the Newtonian Revolution; particular attention to the advent of the new scien-

tific methodology of the 16th and 17th centuries, and to the appearance of the new fields of scientific endeavor. (394) The evolution of scientific doctrine from the age of the Enlightenment through the technological revolution of the 19th century; the relation of science to the religious and political communities; the growth of the new internationalism of the scientific world.

406 **MEDIEVAL INSTITUTIONS** 3. Typical institutions—the Christian Church, feudalism, Roman law, the twelfth-century renaissance, the papal-imperial struggle.

415-416 **NINETEENTH CENTURY EUROPE** 3 prereq 103. Not open to students who have had 215-216. (415) The internal developments and external relationships of the chief European powers, 1815-1870. (416) Continuation to 1900.

424-425 **DIPLOMATIC HISTORY OF RUSSIA** 2 prereq 324-325. (424) Russian foreign relations from Kievan times to the end of the eighteenth century. (425) Continuation since 1800.

427 **HISTORY OF COMMUNISM** 2 prereq 326. The Communist movement and Communist thought since the early 19th century.

431-432-433 **INTELLECTUAL HISTORY OF EUROPE** 3 prereq 101-102-103. Enter any quarter. (431) The main currents of Western thought from classical times to the close of the Middle Ages. (432) Continuation to the end of the eighteenth century. (433) The nineteenth and twentieth centuries.

441 **TUDOR ENGLAND** 3 prereq 242. English social and political institutions from 1485 to 1603; early Tudor government; the break with Rome; the Elizabethan settlement; war with Spain; the Elizabethan political and social structure.

442 **STUART ENGLAND** 3 prereq 242 or 441. Social and political institutions from 1603 to 1714; constitutional conflict; Puritanism; the Civil Wars; Oliver Cromwell; the Restoration settlement; the Glorious Revolution; the emergence of political parties.

443 **MODERN BRITAIN** 3 prereq 243. England since 1815; reform movements; the rise of liberalism; the changing empire; the rise of Labour; England's role in two world wars.

444 **EIGHTEENTH CENTURY BRITAIN, 1714-1815** 3. The era of Parliamentary supremacy.

445 **VICTORIAN ENGLAND, 1815-1914** 3. The making of the modern British state.

453 **CONFEDERATION AND CONSTITUTION** 3 prereq 261. An analytical view of the beginnings of central government in the United States.

454 (354) **THE AMERICAN REVOLUTION** 3. Causes and development of the American Revolution; the Declaration of Independence; organization of state governments; the Confederation period, western lands, finance, commerce; The Constitutional Convention.

455 (355) **THE AGE OF JEFFERSON 1789-1815** 3. The early national period: Federalists and the uses of power; Jeffersonians and the limits of power; the first American party system; The War of 1812.

456 (356) **THE AGE OF JACKSON, 1815-1848** 3. Nationalism and democracy; the second party system; political, social, and economic aspects of Jacksonianism; expansion and the Mexican War.

457 (357) **CIVIL WAR AND RECONSTRUCTION** 3 prereq 261. American history in the mid-nineteenth century, detailing the causes, events and aftermath of the Civil War.

458 **THE GILDED AGE** 3 prereq 262. American history 1876-1900; the politics of complacency; the agrarian revolt; triumphant industrialism; emergence of the United States as a world power; cultural currents of the Gilded Age.

459 **THE PROGRESSIVE ERA** 3 prereq 262. Reform movements and the progressive impulse in American history, 1900-1920.

461-462-463 **AMERICAN INTELLECTUAL HISTORY** 3. Enter any quarter. (461) The formation of the American mind, emphasizing Puritanism and other influences of the colonial period. (462) Main currents of American thought from the founding of the nation to the close of the Civil War. (463) American thought during the past century.

472 (372) **HISTORIC SITES** V R-3. The location and evaluation of historic sites in Montana and the Northwest. Field trips under the joint supervision of archaeologists and historians.

473-474 **HISTORY OF AMERICAN BUSINESS** 3 prereq c/i. Enter either quarter. (473) American business enterprise—its organization, capitalization, and marketing and labor relations—from colonial times to 1860. (474) Continuation to the present.

477 (377) **AMERICAN BIOGRAPHY** 3. Studies in the lives of leading Americans.

480 **HISTORY OF AMERICAN POLITICAL PARTIES AND PARTY SYSTEMS** 3. Origins, political development, and decline of American party systems: Federalists and Jeffersonian Republicans, Whigs and Jacksonian Democrats, and the three phases of rivalry between modern Republicans and Democrats.

491 **EUROPEAN HISTORICAL THOUGHT** 2 prereq 25 cr. in History. The contributions of leading 19th-century European historians to the development of modern historical analysis and interpretation.

492 **PROBLEMS IN AMERICAN HISTORIOGRAPHY** 2 prereq 25 cr. in History. Study of the contrasts in historical interpretation by selecting problems ranging from colonial to contemporary times.

493 (391) **PROBLEMS IN HISTORY** V R-9 prereq 25 cr. in History with "B" average. Study or research in fields selected according to the needs and objectives of the individual student.

495 (395) **SPECIAL STUDIES IN HISTORY** 2-3 R-20 prereq c/i. Offered by different instructors under various titles.

FOR GRADUATES

510 **READINGS IN HISTORY** 2-4 R-20. Independent study and directed research.

531 **FIELD COURSE IN AMERICAN COLONIAL HISTORY** 3-5. Intensive reading in American colonial history.

532 **FIELD COURSE IN THE AMERICAN WEST** 3-5. Intensive reading in Western American history.

533 **FIELD COURSE IN THE CIVIL WAR** 3-5. Intensive reading in the history of the American Civil War.

534 **FIELD COURSE IN MODERN AMERICA SINCE 1877** 3-5. Intensive reading in American history since Reconstruction.

535 **FIELD COURSE IN AMERICAN ECONOMIC HISTORY** 3-5. Intensive reading in American economic development in the nineteenth and twentieth centuries.

536 **FIELD COURSE IN AMERICAN BUSINESS HISTORY** 3-5. Intensive reading in the history of American business in the nineteenth and twentieth centuries.

537 **FIELD COURSE IN THE AMERICAN REVOLUTION** 3-5. Intensive reading.

538 **FIELD COURSE IN EARLY NATIONAL AMERICAN HISTORY, 1789-1848** 3-5. Intensive reading.

541 **FIELD COURSE IN MEDIEVAL EUROPE** 3-5. Intensive reading in the history of the Middle Ages from the fifth to the fifteenth centuries.

542 **FIELD COURSE IN MODERN ENGLAND** 3-5 Intensive reading in British history since 1485.

543 **FIELD COURSE IN MODERN GERMANY** 3-5. Intensive reading in the history of Germany since 1500.

544 **FIELD COURSE IN EUROPEAN DIPLOMACY SINCE 1870** 3-5. Intensive reading in the diplomatic history of Europe in the late nineteenth and twentieth centuries.

545 **FIELD COURSE IN EUROPEAN INTELLECTUAL HISTORY** 3-5. Intensive reading in the intellectual history of Europe since the late Middle Ages.

546 **FIELD COURSE IN EUROPEAN INSTITUTIONAL HISTORY** 3-5. Intensive reading in the history of select European institutions since the early Middle Ages.

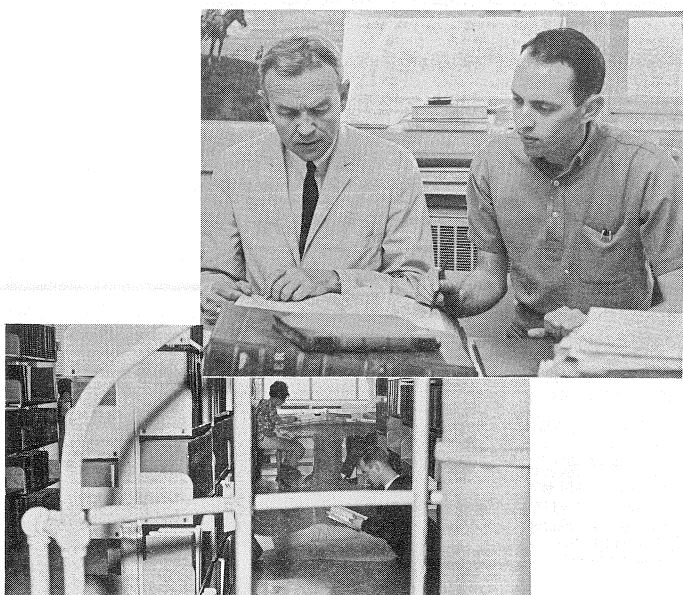
561 (See also Bus. Ad. 561) **BUSINESS HISTORY, LITERATURE AND METHOD** 3 prereq c/i. A survey of the literature of business history from the colonial period to the present, with emphasis upon the methodology and techniques of economic, entrepreneurial, and business history.

591 **METHODS OF HISTORICAL RESEARCH** 2. Annotation, bibliography, and the analysis of source materials.

597 **SEMINAR IN EUROPEAN HISTORY** 3 R-36 prereq 40 cr. in History including 591. Special problems in European History.

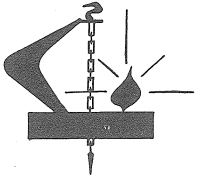
598 **SEMINAR IN AMERICAN HISTORY** 3 R-36 prereq 40 cr. in History including 591. Special problems in American History.

699 **THESIS** V R-9 for M.A. degree and R-20 for Ph.D. degree.



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 three general plans available to the undergraduate major. Plan 1 prepares students for teaching. Plan 2 prepares students for work in Foods and Nutrition and for the Dietetic Internship. Plan 3 provides a program in general Home Economics. Here the student may emphasize Clothing and Textiles, Child Care, or Family Relations. The general major may be combined with other offerings on the campus such as Business, Radio and TV, Social Welfare and others.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN HOME ECONOMICS. A minimum of 50 credits in Home Economics selected as follows:

Required for all majors: Home Economics 155, 209, 241, 246, 309, and 366.

The following additional courses are required according to the plan selected by the student.

1. Preparation for Teaching: Home Economics 157, 210, 258, 302, 303, 305, 310, 321, 358, 367, 368, 421, 490 (321 and 421 may be taken in either Education or Home Economics); Art 125; Chemistry 101; Education 200, 205, 305, 405, 407; Microbiology 100, 101, 306. These courses plus electives combined with a teaching minor will prepare for the certificate to teach Home Economics in secondary schools.

2. Foods and Nutrition and Dietetic Internship: Home Economics 210, 305, 331, 342, 346, 406, 432, 433, 446; Chemistry 121, 122, 261, 262, 481; Microbiology 200, 306; Zoology 202, Education 205, Business Administration 201, 441, Psychology 343. For further requirements consult advisor.

3. General Home Economics: Home Economics 102, 157, 210, 258, 302, 303, 304, 305, 368, 490, plus additional Home Economics credits to make a total of 50 and Chemistry 101.

Clothing and Textiles emphasis: General Home Economics requirements plus Home Economics 264, 352, 358, 359, 360; Art 125, 200, 201, 202; Chemistry 101. Students should satisfy the foreign language requirement. Those planning a career in retailing should take Economics 201, 202, 203; Business Administration 360, 362.

Child Care emphasis: General Home Economics requirements plus Home Economics 310, 331, 346, 367; Chemistry 101; Sociology 305; Social Welfare 181, 385; Psychology 230, 361.

Family Relations emphasis: General Home Economics requirements plus Home Economics 310, 346, 367; Chemistry 101; Sociology 201, 204, 205, 305; Social Welfare 181; Psychology 230, 240; Education 340.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

102 PERSONAL AND FAMILY LIVING 3 (3-0). Personal development and factors which affect family and social relationships. Open to both men and women.

105 GENERAL HOME ECONOMICS 1 (0-2). Selected subjects in Home Economics. Offered by various instructors under different titles.

141 ELEMENTARY FOODS 3 (2-2). The selection, storage, preparation and serving of food. Non-majors and non-minors only.

146 ELEMENTARY NUTRITION 4 (4-0). Fundamental principles of adequate human nutrition. Non-majors and non-minors only.

155 TEXTILE SELECTION 3 (2-2). Fabrics for family clothing and home furnishings. Analysis of fibers, yarns, weaves and finishes.

157 INTRODUCTORY CLOTHING PROBLEMS 3 (3-0). Aesthetic and economic factors in the selection of clothing. Principles of clothing construction with emphasis upon experimentation, organization, and management in fitting and construction techniques.

158 CLOTHING PROBLEMS 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.

209 HOME MANAGEMENT IN THEORY AND PRACTICE 2 (2-0). Resources used in daily living; principles of resource use; management in applying resources to obtain satisfaction for individuals and families.

210 HOUSEHOLD EQUIPMENT 3 (3-0) prereq 209. Principles of operation, materials specifications, selection, care and use of equipment.

241 (141) PRINCIPLES OF FOOD PREPARATION 5 (3-4). The selection, storage, and preparation of food. Methods of food conservation. Majors and minors only. Credit not allowed for both 141 and 241.

246 NUTRITION 4 (5-0) prereq Chem 101. Nutrition given in the light of the chemistry and physiology of digestion.

258 CLOTHING FOR THE FAMILY 3 (1-4) prereq 157. Principles of advanced clothing construction, analysis of patterns and fitting problems, and consideration of economic, psychological and sociological factors in selection of clothing.

264 WEAVING 2 (1-3) prereq Art 125. Basic weaving techniques with emphasis on creativity.

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, contemporary designs and designers, plus qualities to consider in selecting home furnishings.

304 FAMILY HOUSING 3 (3-0) open to non-majors. Housing in relation to needs of various types of families and to the family life cycle.

305 MEAL MANAGEMENT 3 (2-4) prereq 209, 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 4 prereq 241, 246, 305, 309. Residence in the home living center. Management of the home.

321 METHODS OF TEACHING HOME ECONOMICS 3 (3-0) prereq 102, 157, 241. The fundamental principles of organization, unit planning and methods of presentation of subject matter. To be taken by majors and minors before professional quarter. (Home Economics majors may take this course as Education 321.)

331 (431) QUANTITY FOOD PRODUCTION AND SERVICE 4 (2-4) prereq 210, 241. Application of principles of food preparation and food management to institutional situations. Menu planning for institutions.

FOR UNDERGRADUATES AND GRADUATES

342 EXPERIMENTAL FOODS 3 (1-4) prereq 241. Foods from the experimental point of view. Special problems are assigned for individual investigation.

346 FAMILY NUTRITION 3 (3-0) prereq 146 or 246, non-majors c/i. The science of nutrition as it applies to the growth, development, and maintenance of health in all age groups.

352 HISTORY OF CLOTHING AND TEXTILES 3 (3-0). Historic costumes and textiles and their influences on modern dress and fabrics.

358 ADVANCED CLOTHING PROBLEMS 3 (1-4) prereq 258. Modern principles used in the construction of tailored garments. Experimentation with a variety of techniques and fabrics.

359 CLOTHING DESIGN 3 (2-2) prereq Art 125. Art principles applied to designing clothing. Original designs created through flat pattern and draping methods.

360 RECENT DEVELOPMENTS IN TEXTILES 3 (2-2) prereq 155 and Chem 160 or c/i. Developments in fibers and finishes, legislation, and standardization. Comparison and evaluation of textiles.

366 CHILD DEVELOPMENT V 2-3 (3-0) prereq Psych 110. The infant, pre-school and school-age child. Observation required for majors, for non-majors observation optional.

367 ADVANCED PROBLEMS IN CHILD DEVELOPMENT 3 (1-4) prereq 366. Participation in the laboratory.

368 HUMAN DEVELOPMENT AND FAMILY RELATIONSHIPS 3 (3-0) prereq Psych 110. The adolescent and young adult in home, school and community. Problems of aging.

406 NUTRITION IN DISEASE 4 (4-0) prereq 246 or c/i. The symptoms of diseases, prophylaxis and feeding in disease.

421 ADVANCED PROBLEMS IN TEACHING HOME ECONOMICS 3 (3-0) prereq 321, Educ 405. Preparation for teaching of Home Economics in secondary schools. (Home Economics majors may take this course as Educ 421.)

432 LARGE QUANTITY BUYING 3 (3-0) prereq 331. Selection, purchase and storage of foods for institutions.

433 INSTITUTION ORGANIZATION AND MANAGEMENT 3 (3-0) prereq 432. Efficient organization and administration of food service units, employment procedures, personnel schedules, records, food cost, and maintenance.

446 NUTRITION SEMINAR 3 prereq Chem 481 or concurrent enrollment. Readings and discussion of nutritional research.

490 (501) SEMINAR IN HOME ECONOMICS V 1-3. Recent developments and research in Home Economics.

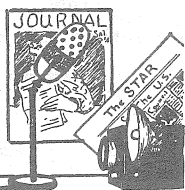
499 PROBLEMS IN HOME ECONOMICS V 1-6. Qualified students may select for study special problems in any of the major fields in Home Economics. Offered by various instructors under different titles.

FOR GRADUATES

699 THESIS V R-15.

JOURNALISM

is a broad study of the various media of communication, with emphasis on the history, privileges, obligations and responsibilities of the media. It includes instruction in the skills necessary for professional careers in newspaper work, radio and television, magazines and books, advertising and photography, public relations and promotion, free lance writing, and related fields. Approximately one-fourth of the academic work for a Bachelor of Arts degree in Journalism will be taken in the School of Journalism. The other three-fourths of the total credits required for graduation will provide a



background in the liberal arts, with emphasis on history, government, economics, philosophy, literature, foreign languages, psychology, and sociology.

The degree of Master of Arts in Journalism also is offered (see Graduate School). Undergraduates specialize in a field which may be news-editorial, radio-television, advertising, or magazines. Instruction in many courses stresses ethics, legal and social responsibilities, and the opportunities for public service.

Graduates obtain positions on newspapers in Montana and in other states, including many metropolitan centers. Some are foreign correspondents. Many are editors and publishers, or hold positions on radio and television stations, with technical magazines, in public relations firms or advertising agencies, and government agencies. Some are distinguished scholars, authors and teachers.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, it is recommended that the high school preparation include study of a foreign language and typing.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN JOURNALISM. In addition to the general requirements the candidate for the degree of Bachelor of Arts in Journalism must complete the recommended core curriculum of 29 hours, plus the requirements of his sequence, plus upper class electives to make a total minimum of 45 hours in Journalism. The core curriculum in Journalism, required of all majors, shall consist of Journalism 100, 270, 290, 360, 361, 371, 372, 380, 381, 491-492-493. A foreign language is required (see FOREIGN LANGUAGE REQUIREMENT in general section of catalog).

CURRICULUM IN JOURNALISM

Freshman Year

Journ 100—Introduction to Journalism	Cr.
Engl 150—Freshman Composition	3
H&PE 100 (3 quarters)—Health and Physical Education	3
Additional courses to meet University requirements	39-46
	48-55

Sophomore Year

Engl 250—Intermediate Composition	3
Journ 270—Reporting	3
Journ 290—History and Principles of Journalism	3
H&PE 100 (3 quarters)—Health and Physical Education	3
Additional courses to meet University requirements	36-44
	48-56

Junior and Senior Years

Engl 350—Advanced Composition	3
Journ 360—Principles of Advertising	3
Journ 361—Advertising Sales	2
Journ 371—Advanced Reporting	2
Journ 372—Specialized Reporting	2
Journ 380—News Editing	3
Journ 381—Advanced News Editing	2
Journ 491-492-493—Senior Seminar	6
Journ Electives (including sequence requirements)	15-35
Additional Electives	52
	90-110
Total recommended hours in Journalism	45
Total recommended hours in General Education	135

180

JOURNALISM CURRICULUM

NEWS-EDITORIAL SEQUENCE: Additional 9 hours required to be chosen from Journalism 327, 390, 470, 495.

ADVERTISING SEQUENCE: An additional 9 hours required to be chosen from Radio-Television 348; Journalism 362, 363, 364.

MAGAZINE SEQUENCE: An additional 9 hours required to be chosen from Journalism 327, 332, 333, 334.

RADIO-TELEVISION SEQUENCE: An additional 9 hours required to be chosen from Radio-Television 341-342-343, 346, 348.

NOTE: Students wishing to major primarily in radio or television journalism should take the radio-television sequence in Journalism. The College of Arts and Sciences and the School of Journalism also offer a curriculum leading to a Bachelor of Arts degree in Radio-Television (see Radio-Television).

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 INTRODUCTION TO JOURNALISM 3. Open to non-majors. History, organization, techniques and responsibilities of the media of mass communication, with emphasis on the newspaper.

128 TYPOGRAPHY 2 prereq c/i. Problems of typographical design and application. Elementary work in printing and the handling of type.

196 CURRENT AFFAIRS 1. Open to non-majors. Current history of the world and its background, relationships and probable influence.

227 ELEMENTARY PHOTOGRAPHY 3 prereq c/i. Open to non-majors. Photographic equipment, materials, and facilities with practice in taking of pictures under varied conditions and processing of films and prints.

270 REPORTING 3. Open to non-majors. Groundwork in gathering, writing and evaluating news.

290 HISTORY AND PRINCIPLES OF JOURNALISM 3. Open to non-majors. American journalism from colonial times against a background of U. S. history with attention to the struggle for freedom of expression.

327 NEWS PHOTOGRAPHY 3 prereq 227. Photographic reporting with emphasis on picture possibilities, significance, interest, and impact. Practice with news cameras.

332 MAGAZINE MAKEUP AND EDITING 3 prereq c/i. Open to non-majors. Theory and practice of editing magazines of general circulation. Practice includes editorial planning and writing.

333 MAGAZINE ARTICLE WRITING 3 prereq c/i. Open to non-majors. The preparation and writing of articles for magazines of general circulation. Techniques of analyzing and selling to magazine markets.

334 TRADE AND TECHNICAL JOURNALISM 3 prereq c/i. Open to non-majors. The writing and editing of trade and business journals, technical and specialized publications.

335 PROMOTION AND PUBLIC RELATIONS 3 prereq c/i. Open to non-majors. The techniques and theories of promotion and public relations.

346 RADIO-TELEVISION PUBLIC AFFAIRS 3. Radio and television special events and information programs, commentaries, interviews and interpretation.

350-351 COMMUNITY JOURNALISM 2 prereq 270. News, editorial, circulation, and advertising problems of weekly and small daily newspapers.

352 NEWSPAPER MANAGEMENT 3 prereq 360. Problems of operation of daily and weekly newspapers.

360 PRINCIPLES OF ADVERTISING 3. Open to non-majors. Theory and techniques with emphasis on the role of advertising as it applies to the producer, consumer, and distributor.

361 ADVERTISING SALES 2 prereq 360 or concurrent registration. Preparation, promotion, and sales of advertising. Lecture and newspaper staff work.

362 ADVERTISING MEDIA 3 prereq c/i. Open to non-majors. Evaluation of advertising media; rate structures and preparation of advertising and schedules.

363 ADVERTISING LAYOUT AND COPY 3 prereq 360. Open to non-majors. Application of typographical and advertising principles to preparation of layouts and copy.

364 RETAIL STORE ADVERTISING 3 prereq 360. Open to non-majors. Integration of retail store merchandising among advertising media. Technical aspects of advertising schedules for retail stores.

371 ADVANCED REPORTING 2 prereq 270. News coverage, reporting and publishing problems.

372 SPECIALIZED REPORTING 2 prereq 371. Specialization in fields of depth reporting.

380 NEWS EDITING 3 prereq 270. Instruction and practice in revision of copy, headline writing, use of references and principles of local and wire news editing.

381 ADVANCED NEWS EDITING 2 prereq 380. Editing and makeup problems.

FOR UNDERGRADUATES AND GRADUATES

316 SCHOOL PUBLICATIONS 3 e/y prereq c/i. Open to non-majors. For students who plan to teach journalism courses in high schools or act as advisers to school publications.

317 SCHOOL PUBLIC RELATIONS Su 3 prereq B.A. degree or teaching experience. The principles of developing better understanding among the school, the press, and the community. For school administrators and teachers.

390 PUBLIC OPINION 3. Open to non-majors. Theories of public opinion, factors involved in its formation, and methods used in its measurement.

397 LAW OF JOURNALISM 3. Legal guarantees and limitations of the right to gather and publish news and to comment on it.

399 ADVANCED JOURNALISM PROBLEMS V prereq consent of the dean. Training and research in advanced journalism problems.

440 CINEMATOGRAPHY 3 prereq 227 or =, and 12 hours in radio-television courses. Motion picture news photography. Film for television.

470 REPORTING PUBLIC AFFAIRS 3. Laboratory work in coverage of political and governmental news at the city, county, state, and federal levels.

491-492-493 SENIOR SEMINAR 2 prereq senior standing in journalism. Investigative methods of editing, study of several aspects of American society which constitute the background for many news stories, and practice in research methods.

495 EDITORIAL WRITING 3. The editorial pages of leading newspapers; practice in research and the writing of editorials.

496 MASS MEDIA IN MODERN SOCIETY 3. Interrelationships between media of mass communication and diverse facets of modern society.

497 INTERNATIONAL COMMUNICATIONS 3. Media of information in other countries, with emphasis on newspapers.

FOR GRADUATES

598 THEORIES OF COMMUNICATION 3 prereq consent of the dean. Structure, processes and effects of communication.

599 METHODS OF JOURNALISM RESEARCH 3 prereq consent of the dean. Problems and techniques in study and analysis of communications.

601 RESEARCH IN JOURNALISM V prereq consent of the dean.

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 take advanced or more specialized studies (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. They are also to be found in the ranks of leading practitioners in many large cities of the United States.

CALENDAR

FALL SEMESTER, 1968

September 23-24, Monday and Tuesday Orientation of new law students
 September 24, Tuesday Registration
 September 25, Wednesday Classes begin at 8:00 a.m.
 November 11, Monday Veterans Day, no classes
 November 27, Wednesday Thanksgiving vacation begins after last class
 December 2, Monday Classes resume at 8:00 a.m.
 December 21, Saturday Christmas vacation begins after last class
 January 6, 1969, Tuesday Classes resume at 8:00 a.m.
 January 27-February 1, Monday through Saturday Semester Examinations

SPRING SEMESTER 1969

February 12, Wednesday Registration
 February 13, Thursday Classes begin at 8 a.m.
 March 22, Saturday Spring vacation begins after last class
 March 31, Monday Classes resume at 8 a.m.
 June 2-7, Monday through Saturday Semester Examinations
 June 15, Sunday Commencement

FALL SEMESTER 1969

September 22-23, Monday and Tuesday Orientation of new law students
 September 23, Tuesday Registration
 September 24, Wednesday Classes begin at 8 a.m.
 November 11, Tuesday Veterans' Day, no classes
 November 26, Wednesday Thanksgiving vacation begins after last class
 December 1, Monday Classes resume at 8 a.m.
 December 20, Saturday Christmas vacation begins after last class
 January 5, 1970, Monday Classes resume at 8 a.m.
 January 26-31, Monday through Saturday Semester Examinations

SPRING SEMESTER 1970

February 11, Wednesday Registration
 February 12, Thursday Classes begin at 8 a.m.
 March 21, Saturday Spring vacation begins after last class
 March 30, Monday Classes resume at 8 a.m.
 June 1-6, Monday through Saturday Semester Examinations
 June 14, Sunday Commencement

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 facilities, descriptions of courses, and miscellaneous administrative regulations the applicant should consult the Law School Bulletin.

REQUIREMENTS FOR ADMISSION: The Law faculty passes on all applications for admission to the Law School. Candidates must be of good moral character and intellectual promise who have received a baccalaureate degree or its equivalent from an approved college or university prior to matriculation in the Law School. An applicant who has completed in residence at an approved college or university three-fourths of the work required for an undergraduate degree may be considered for admission as an exceptional case upon submission of a petition and evidence of high scholastic standing and outstanding aptitude for the study of law, on condition nonetheless that such an applicant qualify for an undergraduate degree prior to receiving a law degree. Non-theory courses are not acceptable except for required courses in physical education to the extent of ten percent of the total credits offered for admission. In addition to the foregoing requirements, no applicant will be admitted who has demonstrated a lack of capacity for self expression as evidenced, for example, by failing to achieve at least average grades (C) in English Composition. It is strongly recommended that all prospective applicants for the Law School complete Latin 101, 102, 103 or the equivalent, and Accounting 201, 202 or the equivalent.

Prior to registration for courses in the second year of Law School, a student who has not received college credit in accounting fundamentals must pass an examination approved by the Law School.

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 \$22.50 must be paid at the time of making application. No refunds will be made, but upon matriculation, if the student enters the semester indicated on the application for admission, this fee will be credited as the registration fee as described under Financial Obligations earlier in the catalog.

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 eligible to continue in the law school previously attended; and (4) that the applicant is eligible to continue in this Law School under the policies specified herein. An applicant is not likely to be 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 will be excluded from the Law School. Any student who has completed two semesters of law study but thereafter fails two courses in any semester will be excluded from the Law School. (2) **Weighted Average:** A student who fails to obtain an index of 1.825 at the end of his first two semesters of law study in all law courses for which he has registered and received a grade will be excluded. A student who fails to obtain an index of 1.825 at the end of his third semester of law study in all courses for which he has registered and received a grade will be excluded from the Law School. A student who fails to obtain an index of 2.0 at the end of his fourth semester of law study in all law courses for which he has registered and received a grade, or fails to maintain such an index thereafter will 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 prior grade. Both grades will be included in calculating the student's grade point index for all purposes.

A student excluded on the basis of substandard academic performance shall not be readmitted, except in extra-ordinary cases when a satisfactory showing is made to the faculty, by written petition, that the substandard performance was the result of unusual circumstances beyond the control of the student, that such circumstances no longer exist, and that the student has the capability and desire to perform satisfactory work.

REQUIREMENTS FOR GRADUATION: Candidates for the degree of Juris Doctor (J.D.) must: (1) be graduates of an approved college or university; (2) complete six semesters in residence at an approved law school, the last two of which must be at the University of Montana; (3) complete ninety semester hours of law with an index of 2.0 in all law courses for which the student has registered and received a grade; and (4) complete the following required courses: all courses taught in the first and second years except Law Review I as specified in the program of instruction below, and the following third year courses: Courtroom and Office Practice, Federal Taxation, Law Review or Legal Aid, and one Seminar each semester. The degree Bachelor of Laws (LL.B.) is awarded to candidates for a law degree who have completed all of these requirements but who were not graduates of an approved college or university prior to matriculation in law school.

Candidates for graduation with honors must achieve an index of 3.1 (honors) or 3.5 (high honors) on law credits attempted and receive the recommendations of the law faculty and of the faculty of the University of Montana. A student who transfers credits earned elsewhere to this University must meet the indicated scholastic index on law grades earned at the University of Montana and on law grades earned elsewhere.

A candidate for the degree of Juris Doctor or Bachelor of Laws who has fulfilled the requirements for graduation will not be recommended for the degree if, in the opinion of the majority of the law faculty, he is 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.

FIRST YEAR

	First Semester Sem. Hr.	Second Semester Sem. Hr.
505—Civil Procedure I	3	3
511-512—Contracts I, II	3	3
515—Criminal Law	3	
508—Criminal Procedure		2
525—Introduction to Law	4	
531-532—Legal Writing I, II	1	1
535-536—Property I, II	2	3
543-544—Torts I, II	2	3

(Add 1 hour of Legal Method (Remedial) for those deficient grade points at end of first semester. No course credit.)

SECOND YEAR*

553—Agency & Partnership	3	
557—Civil Procedure II	3	
561-562—Commercial Transactions I, II	2	3
564—Constitutional Law	4	
554—Corporations		3
569-570—Estate Planning I, II	3	3
573—Evidence		4
583-584—Legal Writing III, IV	1	1
590—Professional Responsibility		2

* (Accounting Fundamentals by course or examination required before commencement of second year.)

ALL COURSES IN THE FIRST TWO YEARS ARE REQUIRED

THIRD YEAR

690—Administrative Law (Seminar)	2	
691—Comparative Law (Seminar)	2	
610—Conflicts of Laws		4
692—Contemporary Legal Problems (Seminar)	2	
694—Contemporary Legal Problems (Seminar)		2
*615-616—Court Room & Office Practice I, II	2	2
621—Creditor and Debtor	2	
695—The Family (Seminar)		2
*631-632—Federal Tax I, II	4	2
696—Jurisprudence (Seminar)		2
641—Labor Law	2	
642-643—Law Review I, II	1	1
651-652—Legal Aid I, II	1	1
647—Legislation	2	
655—Local Government	2	
697—Natural Resources (Seminar)		2
661—Oil & Gas	3	
698—Regulation of Business (Seminar)		2
640—Remedies		3
671—Secured Transactions		3
693—Social Legislation (Seminar)	2	
688—Water Law	3	

*Required Courses. In addition one seminar required each semester.

COURSES

690 ADMINISTRATIVE LAW 2. The nature, the extent and the review by courts of proceedings by agencies, commissions and bureaus of government.

553 AGENCY AND PARTNERSHIP 3. The relations of employer-employee, principal and agent, partnership, non-profit associations and other forms of business organizations.

505 CIVIL PROCEDURE I 3. Court systems, jurisdiction, and problems preliminary to trial.

557 CIVIL PROCEDURE II 3. The steps in a civil action from the pleadings to the trial.

561-562 COMMERCIAL TRANSACTIONS I, II A 2, S 3. Commercial practices in the marketing of goods and in the issuance and transfer of commercial paper including negotiable promissory notes, bills of exchange, checks and bank drafts.

691 COMPARATIVE LAW 2. The nature and functions of law approached through a comparison of the legal systems of two countries which differ sharply in their political, economic and social structures and traditions.

610 CONFLICTS OF LAWS 4. The choice of laws problems, that is, which of several laws should be applied when the issues arise out of a transaction or a relationship which is affected by the laws of several different states.

564 CONSTITUTIONAL LAW 4. The place of written constitutions in our legal system and the judicial function of interpreting written constitutions.

692-694 CONTEMPORARY LEGAL PROBLEMS 2. Problems of contemporary significance, for example, civil rights, consumer credit, juvenile delinquency and the problems of the poor.

511-512 CONTRACTS I, II 3. The formation and the performance of contracts and the elements of mutual assent, consideration, assignments and discharge.

554 CORPORATIONS 3. Problems of corporate management; finance and investor protection; and regulation of securities issues, shareholders suits, dividend and corporate distributions.

615-616 COURTROOM AND OFFICE PRACTICE I, II 2. Established patterns in office procedure, in uncontested legal proceedings and in trial techniques.

621 CREDITOR AND DEBTOR 2. The procedures and methods whereby a creditor obtains recovery from a debtor, with emphasis upon bankruptcy.

515 CRIMINAL LAW 3. Crimes with emphasis upon the criminal act, the requirement and character of criminal intent and limitation upon criminal responsibility.

508 CRIMINAL PROCEDURE 2. Investigation and prosecution of alleged offenders with emphasis upon arrest, bail, indictments, trials and post conviction remedies.

569-570 ESTATE PLANNING I, II 3. The will and the trust and types of future interests in property as devices in the transfer of property at death or prior to death.

573 EVIDENCE 4. The production and presentation of evidence in the course of a trial.

695 THE FAMILY 2. The ways in which family relationships come into being, the various restrictions upon marriage, the problems posed by the family as an existing unit, adoption, juvenile court and the manifold legal relationships between husband and wife and parent and child.

631 FEDERAL TAXATION I 4. The federal income tax relating to individual trusts, partnerships and corporations.

632 FEDERAL TAXATION II 2. The federal estate and gift tax laws.

525 INTRODUCTION TO LAW 4. Legal method and the place of the legal profession in an adversary system of justice; the history of law; the development of types of remedial actions and the philosophies of the law; together with their impact upon legislation and adjudication.

696 JURISPRUDENCE 2. The nature and purposes of law and the nature of the judicial process.

641 LABOR LAW 2. The elements of collective bargaining and labor management relations.

642-643 LAW REVIEW I, II 1. Comprehensive research and writing in limited areas of law. Limited to members of the Law Review staff.

651-652 LEGAL AID I, II 1. Clinical experience under the supervision of a Montana attorney in both civil and criminal cases before the federal and state courts.

531 LEGAL WRITING I 1. Law books and their use and the preparation of legal memoranda and reports with emphasis upon legal writing.

532 LEGAL WRITING II 1. The drafting of legal instruments, moot court briefs and legal memoranda.

583-584 LEGAL WRITING III, IV 1. The preparation of a research paper under supervision of a member of the faculty; the preparation of a brief and presentation of oral appellate argument on a major constitutional question before a faculty-student court.

647 LEGISLATION 2. The preparation, passage and interpretation of legislation.

655 LOCAL GOVERNMENT 2. The administration of government with emphasis upon local governing bodies and their relationships with their state and federal counterparts.

697 NATURAL RESOURCES 2. Elements of mining law and the law of public lands; selected problems of natural resources, particularly oil and gas law and water law.

661 OIL AND GAS 3. The production, conservation and transportation of petroleum.

590 PROFESSIONAL RESPONSIBILITY 2. The lawyer as counselor, advocate, citizen and public servant with emphasis on the nature and extent of professional responsibility.

535 PROPERTY I 2. The law of personal property, possession, and the requisites for acquiring title to land.

536 PROPERTY II 3. The transfer of interests in real property.

698 REGULATION OF BUSINESS 2. The regulation of private business with emphasis upon monopoly, anti-trust, trademarks and unfair competition.

640 REMEDIES 3. The judicial remedies available for injuries to persons and property, for breach of enforceable agreements, and for transactions induced by misrepresentation or mistake.

671 SECURED TRANSACTIONS 3. The use of real property security and the nature and foreclosure of mortgages.

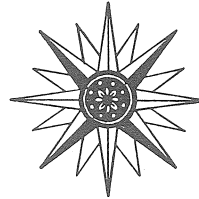
693 SOCIAL LEGISLATION 2. Social security, workman's compensation, unemployment compensation and wages and hours legislation.

543-544 TORTS I, II A 2, S 3. Private civil wrongs other than breach of contract for which a court of law will award damages.

688 WATER LAW 3. The appropriation and use of water and of the relative rights of federal and state governments in the use of this natural resource.

LIBERAL ARTS

The Liberal Arts Curriculum includes Literature, Philosophy, Art, Foreign Languages and the Social Sciences. The latter includes Anthropology, Economics, History, Political Science, Sociology and Geography.



This program permits the student to work in a combination of the above areas rather than in a particular one of them and affords a varied selection from which to choose. During his last two years the student does more advanced work in two areas of his choice.

This curriculum is designed for the student who wants a liberal education with emphasis on the humanities and social sciences. It also provides a broad background for students who decide to prepare for teaching. Those who elect to teach may qualify to do so by taking additional work in education.

Students must have completed, or be eligible for, English 150 in order to major in this program. Upperclassmen transferring into this program should have at least a C average in all credits attempted. The liberal arts curriculum is not designed for the student who is undecided as to his major.

Following are the special requirements for the Bachelor of Arts degree with a major in Liberal Arts:

University requirements	Credits
English 150, 250, 350	9
Group I or II	12
Foreign Languages	23-30
Physical Education (6 quarters)	6
	50-57
Major Requirements (courses under 300)	
1. Art 200-201-202	9
2. Humanities 151-152-153	9
3. Anthropology, Economics, Geography, Psychology, Sociology, (any two)	15
4. History or Political Science or both (History 101-102-103 or 261-262 recommended)	15
5. Literature (English 211-212-213 and 231-232-233 recommended)	12
6. Philosophy (Philosophy 298, 299, 300 recommended)	10
	70
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:	
7. Anthropology, Economics, Geography, Psychology, Sociology (any two)	24
8. History or Political Science or both	24
9. Literature or Philosophy or Humanities 351 and 451 or any combination	24
Electives	18-11
	186

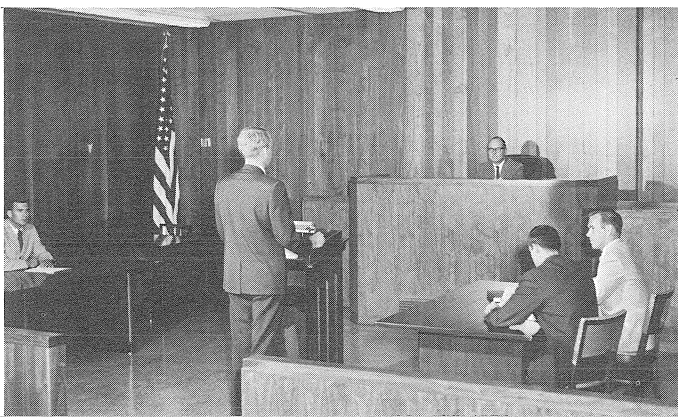
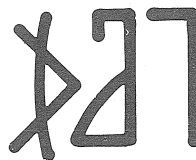
LIBRARY SERVICE. For information on courses, minimum requirements, preparation of school librarians, and the teaching minor in Library Service, check under the School of Education. See education courses 340, 341, 342, 343, 344, 345, 346, 441, 442, 443, 444 and 445. No degree is offered at this time in this field.

LINGUISTICS

is the science which investigates the structure of the languages and dialects which are in use, or have been in use, throughout the world. Its goal is to arrive at a body of

knowledge about specific languages and about the nature of language, and ultimately to create theories of language. Linguistics has implications for many other disciplines and has various applications, particularly in teaching English and foreign languages. Although at present the University offers no degree in linguistics, a concentration in linguistics subjects would prepare a student to enter upon graduate work in linguistics and

would provide him with a background to work in certain government and foundation supported language programs in the U. S. and abroad. The following is a list of linguistics courses offered by departments in the university (each is applicable to a major in the department concerned:



Anthropology 380—Historical Linguistics
 Anthropology 480—Linguistic Methods
 English or General 360—Introduction to Linguistics
 English 371—The Structure of Modern English
 English 372—The History of the English Language
 English 373—Old English
 English 496—The Teaching of English as a Foreign Language
 English 497—Problems in English Linguistics
 German 301—Applied Linguistics
 German 460—History of the German Language
 Romance Philology 360—Introduction to Romance Philology
 Spanish 301—Applied Linguistics
 Spanish 460—History of the Spanish Language
 Speech 119—Phonetics
 Speech 232—Introduction to Communication (Phonology)

MATHEMATICS

is a discipline of intrinsic beauty when considered as an independent entity; it is also a discipline of tremendous utility in the study of the physical, biological, and social sciences, and other disciplines in general. The importance and the usefulness of mathematics have never been greater than at 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 some measure, by the emphasis placed upon mathematics education and mathematics research by various agencies of the national government. The well-prepared graduate in mathematics will find excellent opportunities for a career involving teaching and research in an academic life at the high school or university level, or for a career in applied mathematics in business, industry, or government.

The Bachelor of Arts, Master of Arts and Master of Arts for Teachers, and Doctor of Philosophy degrees are offered.

HIGH SCHOOL PREPARATION. All mathematics courses for university credit require, as prerequisite, the equivalent of two years of high school algebra. Further, it is strongly recommended that the high school preparation include plane geometry, trigonometry and analytic geometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MATHEMATICS. In addition to the general requirements for graduation listed earlier in the catalog, the following requirements must be completed for the Bachelor of Arts degree with a major in Mathematics. Math 151, 152, 153, 251, 252. A foreign language (German, French, Russian, or a combination of these) is required. Students must select one of the following two options.

Option 1. Students planning to enter graduate work or industry are required to take Mathematics 253, 311, 321, 322, 323, 351, 352, 353 and six credits in other approved Mathematics courses, including three credits in courses numbered above 300. The student must present 33 credits in at most three sciences selected from Botany, Chemistry, Geology, Microbiology, Physics, Zoology, and Mathematical Statistics (i.e., Mathematics 341, 342, 343, 441, 442, 443). An alternative is for the student to present 15 credits of French, German, or Russian and 18 credits of one of the above sciences, provided that the language substituted is not one offered to satisfy the language requirement listed earlier in the catalog. A second alternative is for the student to present a second major in one of the schools or departments within the University.

Option 2. Students preparing for secondary school teaching are required to take Mathematics 125, 301, 302, 303, and 5 credits in approved Mathematics courses numbered above 252, and must complete certification requirements for teaching in the secondary schools.

GRADUATE WORK. See Graduate School Bulletin and Mathematics Department Bulletin—*Graduate Work in Mathematics*. Additional information may be obtained from the Chairman of the Mathematics Department.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

001 (100) INTERMEDIATE ALGEBRA 0. A remedial course, of which the content is second year high school algebra.

116 COLLEGE ALGEBRA 5 prereq 001 or exemption by examination. The number system, algebraic operations, binomial theorem, inequalities, systems of linear equations, elementary theory of equations.

117 TRIGONOMETRY 5 prereq 116 or exemption by examination. Trigonometric functions and their graphs, Pythagorean identities, addition formulas, laws of sines, cosines, and tangents, exponential and logarithmic functions and their graphs, solution of triangles.

118 INTRODUCTION TO CALCULUS 5 prereq 116, 117, or exemption by examination. Limits, continuity, differentiation and integration of functions of one real variable, applications, the fundamental theorem of calculus.

121 ELEMENTARY FUNCTIONS 5 prereq high school trigonometry and 001 or exemption by examination. Properties of polynomial, rational, circular, and other elementary functions of one variable.

125 STATISTICS 5 prereq 001 or exemption by examination. Probability models, statistical independence, sampling, tests of statistical hypotheses.

130 THEORY OF ARITHMETIC 5 prereq 001 or exemption by examination. The mathematical meaning and background of arithmetic.

151-152 (118-251) ANALYTIC GEOMETRY AND CALCULUS I-II 5 prereq 121 or 117 or exemption by examination. Limits, continuity, differentiation, integration, differentiation and integration of elementary functions, applications.

153 ANALYTIC GEOMETRY AND CALCULUS III 5 prereq 152. Vector spaces, determinants, matrices, applications in geometry.

199 UNDERGRADUATE SEMINAR V R-15. This course provides for special instruction in mathematics at the freshman and sophomore level.

220 INTUITIVE GEOMETRY 4 prereq 130 or exemption by examination. Space, plane, line and other geometric figures as sets of points, separation properties, deduction versus induction, measurements, coordinate geometry.

251 ANALYTIC GEOMETRY AND CALCULUS IV 5 prereq 153. Partial differentiation, infinite series.

252 ANALYTIC GEOMETRY AND CALCULUS V 5 prereq 251. Multiple integrals, line and surface integrals, infinite series, improper integrals.

253 ANALYTIC GEOMETRY AND CALCULUS VI 5 prereq 251. Solution of ordinary differential equations with emphasis on linear equations, Laplace transform methods, series solutions.

271-272-273 COMPUTING AND MATHEMATICS 3 (3-4) prereq Math 001 and c/i. The elements of linear equations, inequalities, calculus logic and probability are presented with the aid of a digital computer. (271) 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 THE REAL NUMBER SYSTEM 5 prereq or coreq 251. An axiomatic treatment of the construction of the real number system, beginning with the Peano postulates for the natural numbers.

302 (300) ALGEBRA FOR TEACHERS 5 prereq or coreq 251. 301 recommended. The processes of elementary algebra and arithmetic considered from a mature point of view for the teacher of high school algebra.

303 (304) GEOMETRY FOR TEACHERS 5 prereq c/i. The subject matter of high school geometry compared with that of other geometries.

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 teachers improve their background in Mathematics. Content varied to meet the needs of the student. (Credit not allowed toward a degree in Mathematics.)

306 HISTORY OF MATHEMATICS 4 prereq 15 credits in Mathematics. History 101-102 strongly recommended. An historical study of the development of mathematics from the Egyptian and Babylonian eras to the nineteenth century.

311-312-313 APPLIED ANALYSIS 3 prereq 253. (311) Ordinary differential equations. Systems of linear differential equations, series solutions, Bessel and Legendre equations, Picard's method, and selected topics. (312) Classical vector analysis. Linear algebra, matrices, vector analysis, Stokes' theorem, introduction to tensor and analysis, and selected topics. (313) Differential equations. Partial differential equations, separation of variables, Sturm-Liouville systems, special functions, integral equations, and selected topics.

321-322-323 (311-312-314) INTRODUCTION TO ABSTRACT ALGEBRA 3 prereq 252. An introduction to modern ideas of algebra. Groups, rings, fields, vector spaces, matrix theory, and linear groups.

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.)

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.

344-345-346 (302-303) STATISTICAL METHODS 3 prereq a course in college mathematics and c/i. Primarily intended for those who find need for statistical techniques. Probability theory as a model for random phenomena, the foundation of statistical inference, sampling, design and analysis of experiments.

347-348 (337-338) STATISTICAL METHODS 4 prereq 252 and c/i. Probability theory as a model of random phenomena, sample spaces, the algebra of events, expectations, the weak law of large numbers and the frequency interpretation of probability, the nature of statistical inference. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

351-352-353 MODERN ADVANCED CALCULUS 3 coreq 253 or c/i. Set theory, real number system, metric spaces, normed linear spaces with applications to differential equations, functions of several variables, inverse function theorem, integration and Stokes' theorem.

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.)

370 COMPUTER METHODS 4 (3-2) prereq 252. Computer programming and survey of numerical methods. Problems of interest to secondary school teachers. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission. Credit not allowed for this course and computer science 370.)

381 (320) EUCLIDEAN GEOMETRY 3 prereq 153, Geometry from a rigorous, axiomatic viewpoint, Hilbert's Axioms, models of axiom 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 geometries, Riemannian geometry.

383 DIFFERENTIAL GEOMETRY 3 prereq 253. Curves and surfaces in three space, the Frenet formulas for a curve, first and second fundamental forms of a surface, Christoffel symbols and covariant differentiation on a surface, geodesics.

387-388 (327-328) FOUNDATIONS OF GEOMETRY 4 prereq 252 and c/i. Axiomatic systems for and selected theorems from Euclidean geometry, projective and other non-Euclidean geometries, finite geometries, introduction to topology. (Intended primarily for those enrolled in NSF Summer Institute. Other students may enroll by special permission.)

391-392 (324) ELEMENTARY NUMBER THEORY 5 prereq at least 20 credits in Mathematics with a grade of C or better. Congruences, Diophantine equations, properties of primes, quadratic residues, continued fractions, algebraic numbers.

399 SEMINAR V R-15 prereq c/i. Guidance in special work for advanced students.

411-412-413 (415-417-419) MATHEMATICAL METHODS OF SCIENCE 3 prereq 352, 311 (322 recommended). Differential equations, existence theorems, Fuchs' theorem, method of Frobenius, complete and closed sets of orthonormal functions. Fourier series, Sturm-Liouville systems and boundary value problems.

441-442-443 ADVANCED STATISTICS 3 prereq 321, 343, 352. Multivariate distributions, characteristic functions, limit theorems, stochastic processes, design of experiments, further topics to meet the needs of students.

451-452-453 REAL ANALYSIS 3 prereq 353. Lebesgue measure and integration. Lp-spaces, elementary point set topology, metric spaces, and selected topics.

461-462-463 (409-411-412) COMPLEX ANALYSIS 3 prereq 353. Complex numbers and functions, analytic functions, Cauchy integral theorem and formulas, conformal mapping, theory of residues, analytic continuation, and selected topics.

471-472-473 NUMERICAL ANALYSIS 4 (3-4) prereq 253 and 249 for 471, 250 recommended; c/i for 472 and 473. Error analysis; approximation and interpolation, 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 351-352-353 and Math 321-322-323.

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 323. Sylow theorems and applications to finite groups. Series decompositions and selected topics.

522 THEORY OF FIELDS 3 prereq 323. Algebraic and transcendental extensions. Topics from Galois theory, algebraic functions, and/or ordered fields.

523 STRUCTURE OF RINGS 3 prereq 323. Radicals and the Wedderburn theorem. Group rings, tensor products, and selected topics.

524 COMMUTATIVE RINGS 3 prereq 323. Noetherian rings, integral domains, integral extensions, and related topics.

525 MODULES 3 prereq 3 credits from 521, 522, 523, or 524 or c/i. The language of categories, direct and inverse limits, projective and injective modules. Abelian groups as modules over the integers.

531-532-533 TOPOLOGY 3 prereq 353. Set theory, topological spaces, metrizable, continuous mappings, topological mappings, and selected topics.

551-552-553 MEASURE AND INTEGRATION 3 prereq 353. Abstract measure and integration. Radon-Nikodym theorem, Riesz representation theorem, Fubini theorem.

561-562-563 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, Hahn-Banach theorem, closed graph theorem, weak topologies, continuous linear operators, elementary spectral theory.

564-565-566 SPECTRAL THEORY 3 prereq 563. Spectral representation, spectral resolution, Hilbert-Schmidt operators, Riesz operators, differential operators, invariant subspaces.

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.

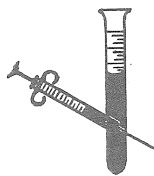
670 GRADUATE SEMINAR IN NUMERICAL ANALYSIS V prereq c/i.

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 3¼ 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 Bachelor of Science in Medical Technology: Microbiology 200, 302, 310, 406, 411, 415, 420; Physics 111-112-113; Zoology 111-112-113, 202, 304, 313; Chemistry 121-122-123, 245, 261-262; Math 116, 117. A minimum total of 45 credits from Microbiology courses listed above and from the following courses in required: Microbiology 306, 350, 404, 405, 418, 430; Chemistry 370, 481, 482, or any other courses approved by the advisor and the chairman of the Department of Microbiology.

SUGGESTED CURRICULUM

Option I

Freshman Year

	A Cr.	W Cr.	S Cr.
Chem 121-122-123—College Chemistry	5	5	5
Zool 111-112-113—Introduction to Biology, General Zoology	5	5	5
Math 116, 117—College Algebra, Trigonometry	3	5	5
Engl 150—Freshman Composition	3		
Group III or IV Electives	3		
H&PE—Physical Education	1	1	1
	17	16	16

Sophomore Year

Chem 261-262—Organic Chemistry	5	5	
Chem 245—Quantitative Analysis			5
Physics 111-112-113—General Physics	5	5	5
Microb 200—General Microbiology	5		
Zool 202—Human Physiology			5
Engl 250—Intermediate Composition		3	
Group III or IV—Electives		2	
H&PE—Physical Education	1	1	1
	16	16	16

Junior Year

Microb 302—Medical Microbiology		5	
Microb 350—Microbial Physiology	5		
Microb 310—Immunology and Serology			5
Zool 304—Comparative Vertebrate Anatomy			5
Engl 350—Advanced Composition	3		
Group Electives	4	6	7
Electives	5	5	
	17	16	17

Senior Year

Microb 406—Clinical Microbiology			5
Microb 411—Epidemiology		3	
Microb 415—Medical Mycology	5		
Microb 420—Virology	5		
Microb Electives	3	5	5
Zool 313—Vertebrate Histology		5	
Electives	4	4	7
	17	17	17

Option II

Under Option II, a student must complete a minimum of 15 elective credits in residence during the senior year. Successful completion of the hospital training in a hospital approved by the American Society of Clinical Pathologists and the Department of Microbiology are required. The student will receive the equivalent of not more than 30 credit hours toward his B.S. degree for the successful completion of the hospital internship.

MICROBIOLOGY

is the study of microorganisms, including the bacteria, yeasts, molds, rickettsiae, viruses and protozoa. Special emphasis is placed on their structure, function, interactions, and relationships with man. Subtopics within the field of microbiology are listed under courses offered.



A Bachelor of Arts degree is granted upon successful completion of the curriculum in Microbiology. The initial work in this curriculum is intended to provide the student with a working knowledge of the basic principles of the physical and biological sciences and mathematics. The remaining study is devoted to a more intense and broadened training in Microbiology and ancillary fields, and may include independent study. This latter experience provides the student with an opportunity to prepare adequately for graduate studies.

Graduates are employed in clinical and research laboratories, in industrial and pharmaceutical laboratories, in county and state health offices, in various federal offices and laboratories, and in many other advantageous positions. The opportunities for employment are currently exceptionally good.

Highly capable graduates often continue their education in Microbiology at the graduate level. The Department of Microbiology offers the Master of Arts, Master of Science, and Doctor of Philosophy degrees. These degrees require an independent research project culminating in a thesis. Opportunities for persons holding graduate degrees in Microbiology are numerous and varied. The Department of Microbiology has available, for qualified graduate students, a number of teaching and research assistantships. (For general requirements of all graduate students and for information regarding graduate study in Microbiology, see Graduate School Bulletin).

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, it is recommended that high school preparation include Algebra, Geometry, Trigonometry, Chemistry, Physics and a foreign language.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN MICROBIOLOGY. In addition to the general requirements for graduation listed earlier in the catalog, the following courses must be completed for the Bachelor of Arts degree in Microbiology: Microbiology 200, 302, 350, 310, 404, 411, 415, 420; Botany 112; Zoology 111-112-113; Chemistry 121-122-123, 245, 261-262; Physics 111-112-113; Math 116, 117. Students planning to do graduate work are recommended, in addition, the following courses: Chemistry 370, 481-482; History 392-393-394; Philosophy 310; Math 118.

A minimum of 45 credits in the major field is required to receive a baccalaureate degree. This requirement may be satisfied by a successful completion of Microbiology courses listed above and any of the following courses: Microbiology 306, 405, 406, 418, 430; Zoology 321; Botany 441; Chemistry 481, 482, or any other courses approved by the adviser and chairman of the Department of Microbiology.

SUGGESTED CURRICULUM

Freshman Year

	A Cr.	W Cr.	S Cr.
Chem 121-122-123—College Chemistry	5	5	5
Zool 111-112-113—Introduction to Biology, General Zoology	5	5	5
Engl 150—Freshman Composition	3		
Math 116, 117—College Algebra, Trigonometry	1	5	5
H&PE 100—Physical Education	1	1	1
Group III or IV Electives	2	2	
	16	18	16

Sophomore Year

Chem 261-262—Organic Chemistry	5	5	
Chem 245—Quantitative Analysis			5
Microb 200—General Microbiology	5		
Engl 250—Intermediate Composition			3
Botany 112—General Botany		5	
Foreign Language	5	5	5
Group III or IV Electives	1	1	3
H&PE 100—Physical Education	1	1	1
	17	17	17

Junior Year

Physics 111-112-113—General Physics	5	5	5
Foreign Language	4	4	
Engl 350—Advanced Composition			3
Microb 350—Microbial Physiology	5		
Microb 302—Medical Microbiology		5	
Microb 310—Immunology and Serology			5
Group III or IV Electives	3	3	4
	17	17	17

Senior Year

Microb 415—Medical Mycology	5		
Microb 420—Virology	5		
Microb 411—Epidemiology		3	
Microb 418—Yeasts			3
Seminar	1	1	1
Microb 404—Molecular Genetics			5
Group III or IV Electives	5	5	5
Electives in Major		5	5
Electives		3	3
	16	17	17

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 practical significance to agriculture, food, drug, fermentation and other industries. (Not allowed toward a major in microbiology.) (Students enrolling in Microb 100 are strongly urged to enroll concurrently 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.)

200 GENERAL MICROBIOLOGY 5 (3-4) prereq Chem 123 or 160. Bacterial taxonomy, morphology, physiology, and ecology; effect of environmental factors on bacteria; microbiology of soil, water, milk and foods; and industrial microbiology. (Credit not allowed for both 100 and 200.)

FOR UNDERGRADUATES AND GRADUATES

300 MICROBIOLOGY FOR TEACHERS 5 (3-4). Introduction to Microbiology for high school science teachers. Not open to microbiology majors. (Credit not allowed for both 200 and 300.)

302 MEDICAL MICROBIOLOGY 5 (3-4) prereq 200 or =. The pathogenic bacteria, fungi, rickettsiae, and viruses, and the clinical, therapeutic and diagnostic aspects of the diseases they produce in man.

304 PHARMACEUTICAL MICROBIOLOGY 5 (3-4) prereq 200. Pathogenic bacteriology, immunology and chemotherapy as they apply to the field of pharmacy. (Not open to microbiology majors.)

306 APPLIED MICROBIOLOGY 5 (3-4) prereq 200 or =. The fundamental principles of food, water, sewage, soil and industrial microbiology.

310 IMMUNOLOGY AND SEROLOGY 5 (2-6) prereq 302. General principles of immunity; laboratory work in serology, animal experimentation and clinical diagnosis.

350 MICROBIAL PHYSIOLOGY 5 (3-4) prereq 200. Physiology of bacteria and related microorganisms.

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.

406 CLINICAL MICROBIOLOGY 5 (3-4) prereq 302 or 304, Chem 262. Principles of hematology, blood chemistry, clinical diagnostic methods. Emphasis on the practical methods used in hospital laboratories.

411 EPIDEMIOLOGY 3 (3-0) prereq 302 or 304. Distribution and frequency of disease; factors affecting its spread and control.

415 MEDICAL MYCOLOGY 5 (3-4) prereq 302, Bot 112 recommended. Morphology, physiology, infectivity and immunogenicity of dermatophytic and system fungi pathogenic for man.

418 YEASTS 3 (3-0) prereq 200, Bot 112 recommended. The classification, cytology, composition, genetics, metabolism and growth and significance of the ascosporogenous and anascosporogenous hyaline and dematiaceous yeasts.

420 VIROLOGY 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, 302 and 3.0 average in biological sciences. Independent research.

FOR GRADUATES

500 ADVANCED TOPICS IN MICROBIOLOGY 2 (2-0) R-10.

501 SEMINAR 1 (1-0) R-9.

502 ADVANCED IMMUNOLOGY 3 (3-0) o/y prereq 310.

505 MICROBIOLOGY LITERATURE (1-0) R-9.

506 MEDICAL PARASITOLOGY 2 (2-0) prereq 302. Principles of parasitism. Parasitic diseases of humans, their epidemiology, control, and chemotherapy.

507 MICROBIAL CYTOLOGY 3 (3-0) o/y. Ultrastructure and function of microbial cells; methodology for study of the cytology of the cell.

509 ADVANCED VIROLOGY V 3-5 (3-5) prereq 420 or Bot 327. Relationships of animal viruses to infectious diseases; tumor induction by viruses; molecular level of viral replication; laboratory work will deal with tissue culture techniques.

510 ADVANCED MICROBIAL PHYSIOLOGY V 3-5 (3-5) a/y prereq 350 or Chem 482. The various metabolic pathways found in microorganisms, with special emphasis on the isolation, structure, function, synthesis, and control of macromolecules.

600 RESEARCH V R-25 prereq 1 quarter of residence and full graduate standing.

699 THESIS V R-15.

MUSIC

The Music Department offers to students who have demonstrated talent in music, the opportunity to continue further study of music either for a profession or an avocation, and to acquire at the same time a broad general education. Complete sequences of courses are given to prepare a student for (a) a career as teacher or supervisor of music in the public schools, or for (b) a career directed toward composition, private teaching, and concert work, or for (c) thorough training in music within the structure of a broad liberal arts curriculum.

The Music Department is a member of the National Association of Schools of Music.

The following undergraduate degrees in music are offered by the Music Department:

Bachelor of Music Education
with a major in Elementary Music
with a major in Choral Conducting
with a major in Instrumental Conducting
with a major in Choral and Instrumental Conducting and Music Administration

Bachelor of Music
with a major in Applied Music
with a major in Theory or Composition

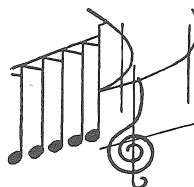
Bachelor of Arts
with a major in Music.

GRADUATE WORK. See Graduate School.

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.

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 Applied Music 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 in their applied 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 choral union every quarter. Students registered in any group must participate in that group for the remainder of the academic year. Piano and organ majors must fulfill this requirement by the election of Music 140 or 106-110. Exceptions to this requirement may be made only by action of the music faculty.

6. All candidates for the Bachelor of Music or Music Education degree must satisfactorily demonstrate completion of 6 credits in Piano 100 or completion of Piano in Class 217. Elementary music majors (Curriculum A-1) must complete 4 credits of piano 100.

7. Outstanding seniors in curriculum A or C may give joint senior recitals. Details will be supplied by the department on request.

8. All candidates for the B.M.E., B.M., or B.A. degree enrolled in Music 201 or 401 shall take a departmental jury in fall and winter quarters, with the following exceptions: (a) Graduating students and (b) students who 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) Sight-singing
- (d) Evaluation of academic record for satisfactory completion, or current enrollment in 213, 239, 236, 217 (or functional), 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 will have completed all lower division requirements within their first three quarters of residence.

APPLIED MUSIC FEES

Non-Music Majors

One half-hour lesson per week	\$12.00
Two half-hour lessons per week	24.00
Three half-hour lessons per week	36.00

Music Majors

One half-hour lesson per week	\$12.00
Two or more half-hour lessons per week	20.00

For majors and non-majors who register for applied music for less than a full quarter or who withdraw before the end of the quarter, a charge of \$1.75 per private lesson will be made. Refunds are based on the number of weeks elapsed since the beginning of the quarter.

Lessons in applied music missed by the instructor will be made up within the quarter. Lessons missed by students or lessons falling on a legal holiday will not be made up.

Music Practice Fee: students enrolled in music courses involving use of practice rooms, pianos, and other university instruments, pay a fee of \$5.00 per quarter.

A. CURRICULUM FOR BACHELOR OF MUSIC EDUCATION DEGREE

For students who sincerely feel the challenge and vital service opportunity in the teaching profession, and whose high school background includes experience in musical organizations, the University of Montana offers the degree of Bachelor of Music with a major in 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 66 credits as follows: 201 (Piano or voice), 6 cr.; 401, 1 cr.; 100 (Piano or voice), 4 cr.; 106-110 or 140 (with faculty approval), 3 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 6 cr.; 125, 1 cr.; 128 or 129, 2 cr.; 135, 4 cr.; 331, 3 cr.; 235 and 236, 6 cr.; 334, 335, 336, 337, 11 cr.; 320, 3 cr.

In cases of a demonstrated proficiency in piano or voice other applied study may be substituted with the approval of the music faculty.

Non-music requirements in addition to general University requirements shall include the following: English 150, 250, 350, 9 cr.; Psychology 110, 5 cr.; Psychology 230, 5 cr.; General 151, 152, 153, 9 cr.; Speech 119, 2 cr.; Group I requirements shall be satisfied by Mathematics 130 and 220, 9 cr.; and General 125, 126, 127, 15 cr. Electives will be presented to complete a total of 82 credits, including requirements for Group III.

Professional courses totaling 34 credits shall include the following: Education 200, 2 cr.; Education 202, 5 cr.; Education 340, 3 cr.; Education 404, 12 cr.; Education 407, 3 cr.; Education 347, 3 cr.; and H&PE 327, 3 cr.

It is recommended that elementary teachers take Health and Physical Education 115 as part of their required work in Physical Education (6 cr.) during the freshman and sophomore years.

Suggested Freshman Program: Music 201, Theory I, Aural Perception I, Introduction to Music Literature; General 125, 126, 127; English 150; Psychology 110; H&PE 100 (or 115); academic electives 6 cr.

(2) with a major in Choral and Instrumental Conducting and Music Administration-Training and background for conducting 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 103 credits as follows: 201, 6 cr.; 401, 1 cr.; 100, 4 cr.; 106-110 or 140, 11 cr. (divided 7 and 4 according to applied major and minor); Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 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.; 323, 324, 325, 6 cr.; 331, 332, 333, 11 cr.; 328, 329, 4 cr.; 408, 1 cr.; upper division music electives, 6 cr.

Exceptions: Students taking piano as Secondary Applied Major will not take the 6 credits of Piano in Class and those with Voice as Secondary Applied Major will not take the 3 credits of Voice in Class, reducing the required Music credits accordingly. Students who complete an academic teaching minor need not complete the 6 credits in upper division music electives.

Non-music requirements in addition to general University requirements include a minimum of 77 credits including the following: English Composition, 9 cr.; Psychology 110, 5 cr.; Education 200, 205, 305, 405, 407, 24 cr.

Students taking piano as Secondary Applied Major must complete Music 320, 321, Piano Methods and Materials.

Suggested Freshman Program: Music 201, 106-110; Theory I, Aural Perception I, Piano in Class, Strings in Class, Introduction to Music Literature; English 150; H&PE; academic electives, 16 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, 5 cr. (piano or voice); 100, 9 cr. (piano or voice with credits for piano or piano in class included); 331, 332, 7 cr. (delete 333); 328, 2 cr. (delete 329); 326, 327, 4 cr.; Instruments in Class (125-6-7 and 128-29-30) 3-6 cr.

Piano or Voice in Class may be deleted according to area of applied major and minor. An academic teaching minor is recommended.

(4) with a major in Instrumental Conducting-Training and background for conducting High School, Junior High School, and beginning instrument groups. (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, 5 cr.; 100, 9 cr. (If piano is major then a wind or string instrument is minor); 331, 333, 7 cr. (delete 332); 328, 329, 330, 6 cr.; Voice in Class, 1 cr. only.

Piano in Class may be deleted according to area of applied major and minor. An academic teaching minor is recommended.

Double majors are possible in curriculum (A) Music Education and (B) Applied Music, Theory, or Composition, if all requirements in both curricula are completed.

B. CURRICULA FOR BACHELOR OF MUSIC DEGREE WITH MAJORS IN APPLIED MUSIC, IN THEORY OR COMPOSITION

The serious instrumentalist or vocalist may enroll for training leading to the degree of Bachelor of Music with a major in Applied Music (including emphasis on piano pedagogy), Theory or Composition. Enrollment may not be completed until the student has received the recommendation of a major professor or a committee of the music faculty.

MAJOR IN PIANO OR ORGAN

Students interested in piano pedagogy follow Curriculum B 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.

Music course requirements for Curriculum B with Major in Piano or Organ shall include a total of 121 credits as follows: 201, 24 cr.; 401, 24 cr.; 106-110 or 140, 12 cr.; Theory I, 6 cr.

Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 6 cr.; 135, 4 cr.; Music History, 9 cr.; Keyboard Harmony, 3 cr.; Piano Methods, 6 cr.; 331, 3 cr.; 445, 2 cr.; Upper division electives, 12 cr.

Non-music requirements in addition to general University requirements include a minimum of 59 credits, including English Composition, 9 credits.

Suggested Freshman Program: Music 201, 106-110 or 140; Theory I, Aural Perception I, Introduction to Music Literature; English 150; H&PE; 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: 201, 21 cr.; 401, 24 cr.; 106 or 107, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 6 cr.; 135, 4 cr.; Music History, 9 cr.; Piano in Class, 6 cr.; 331, 3 cr.; 445, 2 cr.; Upper division electives, 18 cr.

Non-music requirements in addition to general University requirements include a minimum of 59 credits, including English Composition, 9 cr.; and Foreign Language, 15 cr.

Suggested Freshman Program: Music 201, 106 or 107; Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature; English 150; H&PE; Academic Electives, 13 credits.

MAJOR IN ORCHESTRAL INSTRUMENT

Music course requirements for Curriculum B with a Major in an Orchestral Instrument shall include a total of 121 credits as follows: 201, 21 cr.; 401, 24 cr.; 108 or 110, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 6 cr.; Piano in Class, 6 cr.; 135, 4 cr.; Music History, 9 cr.; 140, 6 cr.; 331, 3 cr.; Upper division electives, 12 cr.; 445, 2 cr.

Non-music requirements in addition to general University requirements include a minimum of 59 credits, including English Composition, 9 credits.

Suggested Freshman Program: Music 201, Band or Orchestra, Theory I, Aural Perception I, Piano in Class, Introduction to Music Literature; English 150; H&PE 100, 3 cr.; Academic Electives, 13 cr.

MAJOR IN COMPOSITION OR THEORY

Music course requirements for Curriculum B with Major in Composition or Theory shall include a total of 120 credits as follows: 201, 6 cr.; 401, 6 cr.; 100, 6 cr.; 106-110, 12 cr.; Theory I, 6 cr.; Theory II, 6 cr.; Aural Perception I, 4 cr.; Aural Perception II, 6 cr.; 135, 4 cr.; Music History, 9 cr.; 159, 6 cr.; 259, 6 cr.; 359, 9 cr.; 459, 9 cr.; 331, 3 cr.; 328, 329, 4 cr.; 379, 3 cr.; 380, 3 cr.; Upper division electives, 12 cr.

Non-music requirements in addition to general University requirements include a minimum of 60 credits, including English Composition, 9 credits.

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 complete Music 359, and Music 459.

Composition Majors: A faculty jury examination of representative work in composition must be passed at close of sophomore year. Seniors will present a recital of original music (or equivalent) for solo voice or instrument, and vocal and instrumental groups including at least one composition for large ensemble.

Suggested Freshman Program: Music 201, 100, 106-110; Theory I, Aural Perception I, Composition, Introduction to Music Literature; English 150; H&PE; Academic Electives, 13 cr.

C. CURRICULUM FOR BACHELOR OF ARTS DEGREE WITH A MAJOR IN MUSIC

Students with a pre-college background in applied music may elect Curriculum C, a course designed to develop musicianship, to gain 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 groundwork for graduate study in the fields of musical performance and scholarship in preparation for teaching careers in colleges or private schools.

Minimum credit requirements for this degree are: 180 total credits plus PE with a minimum of 57 credits in Music and a minimum of 120 credits in non-music courses (excluding PE) of which 93 credits must be in the College of Arts and Sciences. Maximum Music credits applicable toward this degree: Applied Music, 12 credits; Ensemble Music, 6 credits (however, Music Department requires participation in ensemble during all resident quarters).

Course requirements for Curriculum C shall include: Music 201, 6 cr.; 401, 6 cr.; Music 106-110, 6 cr.; Music 111, 112-113, 6 cr.; 138-139, 4 cr.; 135, 4 cr.; 237-238-239, 6 cr.; 211-212-213, 6 cr.; upper division music electives, 13 cr.; English 150-250-350, 9 cr.; H&PE, 6 cr.; Foreign Language, 30 cr.; General, 151-152-153, 9 cr.

Suggested Freshman Program: Music 201, 106-110; Theory I, Aural Perception I, Introduction to Music Literature; English 150; H&PE; Academic Electives, 21 cr.

COURSES OF STUDY

Upon entrance into any applied music course 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—Applied Minor 1-2 prereq c/i.

Individual instruction in voice, piano, organ, string, wind, and percussion instruments. Various curricula provide for secondary study in applied music. Secondary 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 applied area.

MUSIC 201, 401 (6 quarters of each course).

Applied Major V 1-4 R-24 prereq audition and c/i. Individual instruction in voice, piano, organ, string, wind, and percussion instruments. The students in Curriculum A must have an applied major 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 Applied Music (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 SUMMER SESSION CHORUS V 1-2.

106 UNIVERSITY CHOIR 1.

107 CHORAL UNION 1.

108 ORCHESTRA 1.

110 UNIVERSITY BAND 1.

Courses 106 through 110 are major musical organizations. Prereq c/i. Music majors must satisfy requirements as stated for each curriculum; non-music majors may take 6 credits.

111-112-113 THEORY I 2. 111 (Basic Theory) may be waived on basis of proficiency examination. The fundamentals and nomenclature of the science of music structure including the study of meters, scales, keys, intervals, triad structures, rhythm, and supplemental ear training. 112-113 prereq 111, 138 for 113. Analysis of music literature to deduce principles of music construction. Application of principles through melodic and contrapuntal writing and correlation with keyboard.

114-115-116 PIANO IN CLASS 1. All major and minor scales 2 octaves HS. All major and minor triads in all positions. Harmonization of simple tunes with I IV V7 chords. Materials such as Oxford and Burrows Adult Beginners books. Transposition, memorization, and sight-reading.

117-118-119 VOICE IN CLASS 1. Breathing, resonance, vowel formation, and posture as related to tone production. Simple vocalises, methods of producing crescendo, diminuendo, legato, staccato, flexibility, velocity. Sight reading. The teaching of vocal technics illustrated.

122-123-124 MUSIC EDUCATION IN THE ELEMENTARY SCHOOLS A 2, W S 3 (122) 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. 122 may be waived on basis of proficiency examination.)

125-126-127 STRING INSTRUMENTS IN CLASS 1. Group instruction for beginning students on violin, viola, cello, and bass, with emphasis on teaching procedures.

128-129-130 WOODWIND; BRASS; PERCUSSION AND BAND 2. (128) Basic instruction in woodwinds. (129) Basic instruction in brass instruments. (130) Prereq 128, 129. Basic instruction in percussion and practical experience in performing elementary band materials, using instruments studied in Music 128 and 129.

134 INTRODUCTION TO CONCERT MUSIC 4 (3-2). Music in our present-day culture; illustrated lectures for the layman on forms, styles and composers of concert music. Guided listening to recordings 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/i. (Credit not allowed for both 134 and 135.)

138-139 AURAL PERCEPTION I 2 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 acquaintance with music literature; accompanying. Students may register for more than one ensemble group in any one quarter.

159 (159-160-161) COMPOSITION 2 R-6 prereq c/i. 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. The study of music construction with emphasis on harmonic structure. The chorale style, modulation, altered chords, and harmonic and formal analysis correlated with keyboard application.

215-216-217 INTERMEDIATE PIANO IN CLASS 1 prereq 3 credits in either Piano I, Music 114-115-116, or placement test. All major and minor scales 2 octaves HT. Further development of harmonization, transposition, memorization, and sight-reading. Materials such as Felton Progressing Studies and Bartok Mikrococosmos Books I and II.

234-235-236 HISTORY OF MUSIC 3 prereq 135. Enter any quarter. The history of music in Western Civilization from its origin to modern times and its relationship to general cultural development.

237-238-239 AURAL PERCEPTION II 2 prereq 113 and 139, coreq 211-212-213. A lab course in singing and dictation to supplement the academic disciplines of Theory II.

247-248-249 KEYBOARD HARMONY 1 prereq or coreq 213 and c/i. Practical application of theory principles to the keyboard. Exercises in modulation, transposition, and development of extemporaneous playing.

259 (259-260-261) COMPOSITION 2 R-6 prereq 6 credits of 159. Original work in composition. (May be substituted for upper division electives for students not majoring in theory or composition.)

311-312-313 THEORY III 2 prereq 213. Chromatic harmony; altered chords, foreign modulation; analysis and writing in Classic and Romantic styles, both instrumental and vocal.

319 PIANO FOR THE CLASSROOM TEACHER 2. Presenting simple material at a basic level of skill, toward a wider utilization of the piano in classroom and school situations.

320-321 PIANO METHODS AND MATERIALS 3 e/y prereq placement in Piano 401. Methods and materials for teaching piano classes in public schools and private studios. Procedures in teaching beginning, intermediate and advanced students in private studios. Practical demonstrations and supervised laboratory experience with children and children's classes.

323-324-325 SCHOOL MUSIC 2 prereq 331. (323-324) Elementary music procedures and materials for supervising and teaching music in grades 1 through 6. (325) Junior High School Music. General and specialized music instruction for grades 7 through 9.

326-327 CHORAL ARRANGING 2. Practical experience in arranging for vocal groups including the specific problems of the immature and changing voice.

328-329-330 (329) ORCHESTRATION 2 prereq 213. Orchestrating and transcribing for orchestra and band.

331-332-333 CONDUCTING METHODS AND MATERIALS A 3, W S 4, Su 3 or 4 prereq 10 credits in music including 113. (331) Fundamentals of conducting. (332) Choral conducting; choral methods and procedures; general music classes in secondary schools. (333) Instrumental conducting; procedures and materials for instrumental instruction at all levels; theory classes in secondary schools.

334-335-336 ELEMENTARY MUSIC TEACHING 3. Grade music procedures, materials, and equipment. (334) Kindergarten through Grade 3. (335) Fourth through Grade 6. (336) Seventh and eighth grades. Elementary Music Education Majors only.

337 ELEMENTARY MUSIC ADMINISTRATION AND SUPERVISION 2. Administration and supervision of elementary music in the public schools, the development of curriculum in general music and related arts.

359 (359-360-361) COMPOSITION 3 R-9 prereq 213 and 6 credits of 259. Creative writing of music.

379-380 SIXTEENTH CENTURY COUNTERPOINT 3 coreq 213. Writing and analysis. Renaissance vocal and instrumental style.

408 CONDUCTING SEMINAR 1 prereq Educ 405. Music education and conducting. Review of recent publications in choral and instrumental music.

421 MUSIC OF THE BAROQUE PERIOD 3 prereq 135 and 213. Detailed analysis and comparison of selected instrumental, vocal and keyboard compositions of the Baroque Period, 1600-1750.

422 MUSIC OF THE CLASSICAL PERIOD 3 prereq 135 and 213. Detailed analysis and comparison of selected instrumental, vocal and keyboard compositions of the Viennese-Classical Period, 1750-1828.

423 MUSIC OF THE ROMANTIC PERIOD 3 prereq 135 and 213. Detailed analysis and comparison of selected instrumental, vocal and keyboard compositions of the Nineteenth Century.

424 MUSIC OF THE TWENTIETH CENTURY 3 prereq 135 and 213. Detailed analysis and comparison of selected instrumental, vocal and keyboard compositions of the Twentieth Century.

445 SENIOR RECITAL V 1-2 coreq 401.

459 (459-460-461) COMPOSITION 3 R-9 prereq 9 credits of 359. A continuation of composition with writing in the larger forms.

FOR UNDERGRADUATES AND GRADUATES

308 WORKSHOP IN MUSIC EDUCATION V 1-3 prereq junior standing in music or teaching experience. Special workshops and clinics in elementary and secondary public school teaching problems.

441 READINGS IN MUSIC CRITICISM 3. Comparison of selected writings of 20th century composers, including Stravinsky, Hindemith, Schoenberg, Sessions and Copland. (For the layman as well as the music student.)

FOR GRADUATES

501 APPLIED TECHNIQS V 1-4 R-12. Individual instruction in voice, piano, organ, string or wind instruments. Students desiring further study of minor applied fields may elect 1-2 credits.

511 (431) ADVANCED CONDUCTING 3 R-6 prereq 332 (Choral majors), 333 (others), and c/i. A continuation of 331-332-333. Class and/or individual study of the art of conducting with emphasis on applied work with university performing groups.

512 LITERATURE FOR HIGH SCHOOL INSTRUMENTAL GROUPS 2 a/y. Comparative study and performance of new publications.

513 LITERATURE FOR HIGH SCHOOL CHORAL GROUPS 2 a/y. Comparative study and performance of new publications.

514 CURRENT LITERATURE FOR HIGH SCHOOL SOLO AND SMALL ENSEMBLE GROUPS 2 a/y. Comparative study and performance of literature with attention to pedagogical use as related to style.

515 PROBLEMS IN TEACHING ELEMENTARY MUSIC 2 a/y. Evaluation of new approaches; state and city course outlines; Music in ungraded schools; Problems selected 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, techniques, tabulation of materials, concepts necessary for interpretation of data.

523 SCHOOL MUSIC ADMINISTRATION 3. School systems, plans for organizing and administering the music program in the elementary, junior and senior high school. For students whose primary purpose in advanced study is preparation for administrative or supervisory work in music education.

524 MUSIC IN HIGHER EDUCATION 3. A survey of administrative problems, curricular content, contemporary teaching techniques, teaching personnel, and other areas of interest to the music teacher at the college level.

530 INDEPENDENT STUDY V R-9. Students must have projects approved by a music staff member before enrolling.

531 SYMPHONIC LITERATURE 3. A survey of orchestral music; the Mannheim composers, the Viennese classics, the Romanticists, and contemporary European and American developments.

532 OPERATIC LITERATURE 3. Opera from its beginnings, the Florentine Camerata, 16th and 17th century French and Italian opera, Gluck's reforms, Mozart's dramatic works. The Romantic opera in Italy and Germany, contemporary opera trends.

533 KEYBOARD LITERATURE 3. Keyboard literature from the developments of the Baroque era to the contemporary period, including the suite, sonata, character pieces, etc.

534 CHAMBER MUSIC LITERATURE 3. Survey of chamber music, quartet, trio, quintet, etc., in various instrumental combinations. The literature is presented through the analysis of formal structure and aesthetic values are discussed.

535 SONG LITERATURE 3. The art song from the classic period to the contemporary era including the German lied, French chanson, and related literature.

536 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.

538 TRENDS IN CONTEMPORARY MUSIC 3. A survey of trends in European and American music from the end of World War II to the present. Emphasis on the development of electronic music, the serial technique, and other new techniques of composition.

539 HISTORY OF AMERICAN MUSIC 3. The development of American music from its antecedents. The effect of an evolving democratic state on the arts, the development of various centers of performing arts and the types of music performed.

541 INTRODUCTION TO MUSICOLOGY 2. Nature, scope, and goal of musicology, its methods and history. Survey of bibliography, different approaches and styles of scholarly writing. Formats and techniques of writing.

542 MEDIEVAL AND RENAISSANCE MUSIC 3. Survey of music from monophony to the 16th century.

551-552-553 ADVANCED ORCHESTRATION 2 prereq 329. Styles in orchestration techniques from 1750 to present.

554-555-556 ANALYTICAL TECHNIQUES 2. A survey of the theoretical approach of leading composers from the polyphonic period to the present.

557 TECHNIQUES OF COMPOSITION 2. An introduction to composition for graduate students. Development of techniques and skills necessary to the composer.

558 PEDAGOGY OF THEORY 3. The teaching of theory, including techniques, procedures and sequences of materials and a comparison of standard harmony texts. The application of teaching techniques, and organization of the teaching of theory in secondary schools and in colleges.

559 COMPOSITION V R-12.

562 SEMINAR V 1-5 R-15. Investigation of research in fields of individual interest.

599 GRADUATE PROJECT IN MUSIC V R-6.

601 APPLIED TECHNICS V 1-4 R-12. Individual instruction in voice, piano, organ, string or wind instruments. Students desiring further study of minor applied fields may elect 1-2 credits.

699 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 identification, selection, combination, analysis, standardization, and mode of action.



The curriculum offered by the School of Pharmacy consists of a five-year program leading to the degree of Bachelor of Science in Pharmacy. The first two years, or pre-professional portion of the curriculum, are spent in studies of the basic physical and biological sciences, and in other course work necessary to satisfy the general university requirements. During the final three years of the curriculum, the student devotes his time to the study of the several pharmaceutical sciences. This program of study is designed to prepare him to serve the pharmaceutical needs of the public. Areas of additional special study include pharmaceutical chemistry, pharmacognosy, pharmacology, 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 one year of "practical experience" or internship in a pharmacy 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 Association 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 prescribed 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 transferring 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 designed 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 approved by the faculty advisor.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University, the student needs algebra and geometry. It is also recommended that the high school preparation include advanced algebra, trigonometry, biology, chemistry, physics and particularly, if the student may pursue advanced studies in pharmacy, a foreign language.

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):

First year: Chemistry 121-122-123, English 150, Physical Education 100 (3 cr.), Math 116, 117, Botany 112, Zoology 111, 113, and electives.

Second year: Chemistry 261-262-263, Economics 201-202-203, Physical Education 100 (3 cr.), Physics 111-112-113, English 250, group electives.

Applicants presenting two years of satisfactory college work but with certain deficiencies in the above list may be admitted, but such deficiencies must be removed.

Each applicant for admission to the professional curriculum must have a cumulative grade point index of 2.0 on all college work taken, and completed for credit at the time he makes application for admission to the first professional year. Application forms for admission to the professional curriculum may be obtained from the School of Pharmacy 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 will not be granted senior standing but will be required to retake 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. The student must fulfill all required courses for the first four years of study before he may enter the fifth year of the program. Then he may be admitted to senior standing and may become a candidate for 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 45 credits per year.
3. Complete not less than 225 credits of course work, plus six credits in required Health and Physical Education and basic ROTC courses when these are taken.

REQUIREMENTS FOR LICENSURE IN MONTANA. An applicant for licensure as a 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, at least twenty-one years of age, and shall be a graduate of an accredited school of pharmacy. However, such an applicant shall not receive a license until he has completed an internship of at least one year, following graduation, in an approved pharmacy in the state of Montana.

GRADUATE WORK. See Graduate School.

PHARMACY CURRICULUM

First year: English 350; Business Administration 201, 202; Chemistry 245, 481, 482; Pharmacy 306, 220; Zoology 340-341; electives.

Second year: Microbiology 200, 304, 411; Pharmacy 414-415-416, 424-425, 452, 461, 462, 463, and electives.

Third year: Pharmacy 503, 504, 505-506, 516, 517-518-519, 540-541-542, 577, 578, 598, and electives.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

220 PHARMACEUTICAL CALCULATIONS 3 (2-2). Metrology, pharmaceutical mathematics, terminology and form of the prescription, practical laboratory work using apparatus for measuring and weighing.

306 (206) ORIENTATION TO PHARMACY 3 (3-0). Career opportunities, literature, history and terminology, library orientation.

340 RADIOPHARMACOLOGY 2 (2-0) prereq Chem 476 or c/i. Drug metabolism and internal dosimetry.

377 COMPUTER APPLICATIONS TO PHARMACY 2 (2-0) prereq Math 249 or =. Exercises in programming with reference to inventory, finances and drug activity.

414-415-416 MEDICINAL CHEMISTRY 414-415, 3 (3-0); 416, 5 (5-0), prereq Chem 263. Organic substances used medicinally with emphasis on the correlation of chemical structure with therapeutic activity.

418 ORGANIC MEDICINAL PRODUCTS LABORATORY 2 (0-6 to 9) R-4 prereq 414. Synthesis, identity and purity tests of organic medicinals.

424-425 (324-325) PHARMACOGNOSY 4 (3-3) prereq Bot 112 and Chem 263 or =. Plant and animal products used in pharmacy and medicine.

70—PHILOSOPHY

440 DRUGS OF PSYCHOPHARMACOLOGY 3 (3-0) prereq Chem 263 and 482, Zool 341. Drugs which influence behavior and the mental state.

452 DRUG ANALYSIS 4 (2-6) prereq Chem 245. Special and instrumental methods used in the analysis of pharmaceutical preparations.

461-462-463 PHARMACY 5 (3-4) prereq 220 and Chem 263. Fundamental technics of pharmacy and the various classes of pharmaceutical preparations. Throughout the course the underlying physical and chemical principles employed or responsible for any phenomena observed are studied.

466 MEDICINAL PLANTS AND PHARMACOGNOSTICAL TECHNIQUES 3-5 (0-9 to 15). Collection, extraction and identification of the constituents of plants of medicinal importance, using chromatography and instrumental techniques.

468 DRUG MICROSCOPY 2 (0-4) prereq junior standing in pharmacy and c/i. Microscopic and micro-chemical examination of drugs, foods and spices. The detection of adulterants and impurities.

503-504 BIOLOGICAL MEDICINAL PRODUCTS 3 (3-0) prereq Microb 304. Biologicals, antibiotics, vitamins, hormones, and other medicinal products of biological origin.

505-506 DISPENSING 4 (2-6) prereq 463. Fundamental principles of prescription compounding by means of a detailed study of the common dosage forms and special forms of medication.

516 PHARMACEUTICAL LAW 3 (3-0) prereq senior standing in pharmacy. State and federal laws pertaining to the practice of pharmacy.

517-518-519 PHARMACEUTICAL PRACTICE 1 (0-2) prereq senior standing in pharmacy. Students are assigned to the University of Montana Prescription Pharmacy in order to acquaint them with current practices.

540-541-542 PHARMACOLOGY 4 (3-3) prereq senior standing in pharmacy. The pharmacodynamics of drugs and its application to therapeutics.

577-578 PHARMACY ADMINISTRATION AND FINANCIAL MANAGEMENT 3 (3-0) prereq senior standing in pharmacy. A detailed study of the administration of a pharmacy with emphasis on financial and personnel management.

FOR UNDERGRADUATES AND GRADUATES

555 ADVANCED PHARMACY V 3-5 (0-9 to 15) prereq 506 or —. The more complex problems involved in formulation and preparation of pharmaceuticals.

570 COSMETICS 3 (1-6) prereq 463. Theory and technic of cosmetic formulation.

585 ADVANCED DRUG ANALYSIS 3 (1-6) prereq 452. The more involved methods of analysis as applied to pharmaceuticals.

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, coreq 593. Duties and responsibilities of a pharmacist practicing in a hospital or related institution, with special emphasis on the provision of professional services to small hospitals and nursing homes.

598 SEMINAR 1 (1-0) R-6 prereq senior standing in pharmacy.

599 SPECIAL PROBLEMS IN PHARMACY V 2-5 (0-3/cr) R-10 prereq senior standing in pharmacy. Research studies by conference, library and laboratory research in pharmacy, pharmaceutical chemistry, pharmacognosy, pharmacy administration or pharmacology.

FOR GRADUATES

580 ADVANCED PHARMACEUTICAL LAW 3 (3-0) prereq c/i. Federal laws affecting the pharmaceutical industry, with emphasis upon the Food, Drug and Cosmetic Law and the regulations and rulings of the Food and Drug Administration.

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, including economics, competitive practices, and the internal and external factors affecting the industry.

586 PARENTERAL PREPARATIONS 3 (2-6) a/y. The study and evaluation of the various methods currently used in the preparation of bulk and individual dosage unit sterilized products. Emphasis will also be stressed on drug stability when such preparations are subjected to various sterilization procedures.

587 CHROMATOGRAPHY 3 (2-6) a/y. Advanced theory and applications of the various technics of modern chromatography. All phases, column, paper, thin-film, gas and ion exchange, will be explored and evaluated.

602 ADVANCED PHARMACOGNOSTICAL TECHNIQUES 3 (0-9) prereq 466. Technics used in investigative pharmacognosy.

605 CHEMISTRY OF NATURAL PRODUCTS 3 (3-0) R-9 prereq 416. Alkaloids, including methods of isolation, degradation studies, proof of structure, and synthesis, with emphasis on the pharmaceutical compounds. Volatile oils, terpenes and sterols, including their occurrence, methods of isolation and chemistry. Glycosides and related compounds, including methods of isolation, proof of structure, synthesis and chemistry.

608 PHARMACEUTICAL CHEMISTRY 3 (3-0) R-9 prereq 416. The organic medicinals with emphasis on proof of structure, synthesis, structure-activity relationships and chemistry.

611 ADVANCED ORGANIC MEDICINAL PRODUCTS LABORATORY 2 (0-6 to 9) R-6. Preparation, isolation and purification of organic medicinals by advanced technics.

619 ADVANCED PHARMACOLOGY V 3-5 (0-9 to 15) prereq 542 or —. 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. Emphasis is placed on such aspects as feasibility of the operation for large scale production and uniformity, durability or stability and acceptability of the finished product.

632 PHYSICAL PHARMACY 3 (3-0) R-6. The physico-chemical aspects of homogeneous and heterogeneous systems are examined in light of the latest concepts. Application of theory to practical pharmaceutical systems is stressed.

634 PRODUCT DEVELOPMENT AND FORMULATIONS 3 (0-9) R-6 prereq 630. The practical aspects of manufacturing and the theory of systems in developing new product formulations.

636 AEROSOLS 3 (2-3). The theory of formulation and production of aerosols with emphasis upon pharmaceutical applications.

640 RADIOISOTOPES IN PHARMACY 3 (2-3) prereq chem 476. Types of radiation, methods of detection and use in pharmacy as therapeutic agents and as diagnostic and research tools.

699 THESIS V R-15.

PHILOSOPHY

is the search for wisdom by carefully reasoned reflection. Philosophical enquiry is concerned with such questions as: How can we distinguish reality from appearance? Is the



world to be understood as a quantity of material objects, as a framework of mental experiences, or as an open field for action? By what methods can man attain knowledge and what kinds of knowledge? Are values derived from personal feelings or from standards which may be impersonal, verifiable, unchanging? Are there significant relations among phases of experience reflected in science, art, religion, morality and politics?

Courses in philosophy acquaint the students with the views of great philosophical thinkers, past and present. Discussion and written work are largely concerned with evaluating the reasoning by which each thinker develops his point of view.

The Bachelor of Arts and Master of Arts degrees are offered.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PHILOSOPHY. In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed for the Bachelor of Arts degree with a major in Philosophy: a minimum of 50 credits including Philosophy 110, 210, 298, 299, 300, and three or more credits in courses numbered 400 or above. Normally students are expected to complete Philosophy 298, 299, 300 by the end of their sophomore year. The foreign language requirement listed earlier in the catalog must be satisfied.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

100 INTRODUCTION TO PHILOSOPHY 5. The main problems of metaphysics, theory of knowledge, and moral philosophy; the manner in which great philosophers reach their conclusions.

110 LOGIC 5. Deductive and inductive inference, kinds of definition, the detection of fallacies, and the methods of science.

120 ETHICS 5. The nature of moral values, standards of moral judgment, moral problems in personal life and in social relations.

210 SYMBOLIC LOGIC 5. A systematic study of deductive logic using modern symbolic techniques.

298 (201) HISTORY OF ANCIENT PHILOSOPHY 5.

299 (202) HISTORY OF MEDIEVAL AND RENAISSANCE PHILOSOPHY 5 prereq 298.

FOR UNDERGRADUATES AND GRADUATES

300 (203) HISTORY OF MODERN PHILOSOPHY 5 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 (353) PHILOSOPHY OF SCIENCE 5 o/y prereq c/i. The metaphysical foundations of modern classical (Newtonian) science; contemporary views on the nature and limitations of scientific "explanations," theories, models and concepts.

311 (352) PHILOSOPHY OF LANGUAGE 5 e/y prereq c/i. Structure and functions of natural and ideal languages; the relations of language to thought and to reality.

320 CONTEMPORARY ETHICAL THEORIES 5 prereq 120 and/or 300. Recent theories on the nature of moral concepts.

323 (369) POLITICAL PHILOSOPHY 3 o/y prereq 5 credits in philosophy. Basic concepts, ideals, and principles which underlie the political theories and programs of the Western world. Special attention will be given to Democratic forms of government and to the balance of liberal and conservative elements in them.

330 PHILOSOPHY IN THE TWENTIETH CENTURY 5 prereq 10 credits in Philosophy.

331 PHILOSOPHICAL FOUNDATIONS OF THE SOCIAL SCIENCES 5 o/y prereq 10 credits in Philosophy and c/i. Philosophical problems with respect to representative theories in Psychology, History, Sociology.

340 AESTHETICS 3 prereq 3 credits in Philosophy. The nature of aesthetic experience, of the standards of art criticism, and of the kinds of knowledge communicated by art. Readings from philosophers, artists, and art critics.

341 PHILOSOPHY IN LITERATURE 3 prereq 10 credits in Philosophy or Literature or =. Philosophical thought in selected masterpieces of literature.

345-346-347-348 PHILOSOPHY OF THE ARTS prereq 3 credits in Philosophy or 3 credits in music, visual arts, literature or =. Enter any quarter. (345) Music. (346) Visual arts. (347) Literature. (348) Film. Examination of philosophical problems related to the particular arts and discussion of the nature of the arts.

350 THEORY OF KNOWLEDGE 3 e/y prereq 10 credits in Philosophy. Some traditional and contemporary views of the source, nature, and extent of knowledge with special attention paid to the relation of perception to the physical world, and to the concept of mind.

351 METAPHYSICS 3 prereq 10 credits in Philosophy. What are the basic questions of Metaphysics? What questions does it attempt to answer? What questions is it fitted to answer? Traditional and contemporary pursuits of these questions.

354 PHILOSOPHY OF RELIGION 5 e/y prereq 5 credits in Philosophy. Philosophical interpretation of religious experience, belief and practice.

355 ORIENTAL THOUGHT 3 o/y prereq 5 credits in Philosophy and c/i. Philosophical themes in some Hindu, Buddhist and Taoist literature.

357 THE PHILOSOPHY OF HISTORY 5 e/y prereq c/i. 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/i. Reading and interpretation of selected works.

361 ARISTOTLE 5 e/y prereq 298 or 10 credits and c/i. Reading and interpretation of selected works.

365 DESCARTES, SPINOZA, LEIBNIZ 5 e/y prereq 300 or 10 credits in Philosophy and c/i. The development of Continental Rationalism.

366 LOCKE, BERKELEY, HUME 5 o/y prereq 300 or 10 credits in Philosophy, and c/i. The development of British Empiricism.

367 KANT 5 o/y prereq 300 or 10 credits in Philosophy and c/i. Reading and interpretation of selected works.

368 NINETEENTH CENTURY DIALECTICAL PHILOSOPHY 3 e/y prereq 300 or 10 credits in Philosophy and c/i. Selected reading and interpretation of Hegel and other "dialectical" philosophers.

369 NON-DIALECTICAL PHILOSOPHY IN THE NINETEENTH CENTURY 3 o/y prereq 300 and 368 or 10 credits in Philosophy and c/i. Selected reading and interpretation of non-Hegelian philosophers in the 19th Century.

373 EXISTENTIALISM 5 prereq 10 credits in philosophy and c/i. Selected readings from the philosophical works of one or more existentialist thinkers.

390 PROBLEMS IN PHILOSOPHY V prereq c/i.

430 SEMINAR: HISTORY OF PHILOSOPHY V prereq c/i.

453 SEMINAR: PHILOSOPHY OF SCIENCE V prereq 210 and 310 and c/i.

460 SEMINAR: RESEARCH IN PROBLEMS OF PHILOSOPHY V prereq c/i. Advanced research in problems of philosophy.

490 SEMINAR V prereq c/i.

FOR GRADUATES

500 RESEARCH V R-15. Work on selected problems under direction.

699 THESIS V R-15.

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.

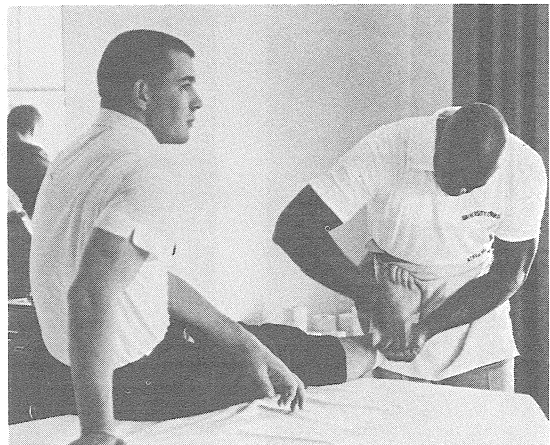
During the first three years the student completes 135 credits plus six in required physical education. This work is to include the general requirements for graduation (the second and third years must be taken in residence at the University of Montana). The fourth or professional year of training, involving twelve to sixteen months of work, would be taken at any physical therapy school meeting standards established by the Council on Medical Education and Hospitals of the American Medical Association. (Not all therapy schools accept students with three years of background. Some schools, for example, require a college degree for admission, while 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.

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. It is also recommended that the high school preparation include college preparatory courses with emphasis on the biological and physical sciences.



Following are the requirements leading to the Bachelor of Science degree with a major in physical therapy:

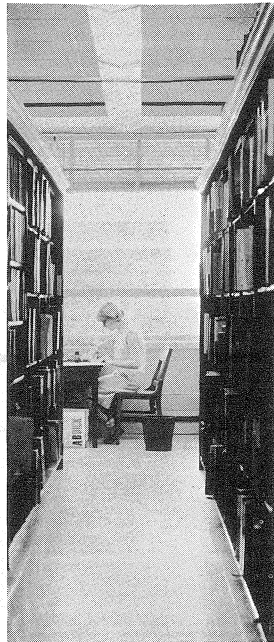
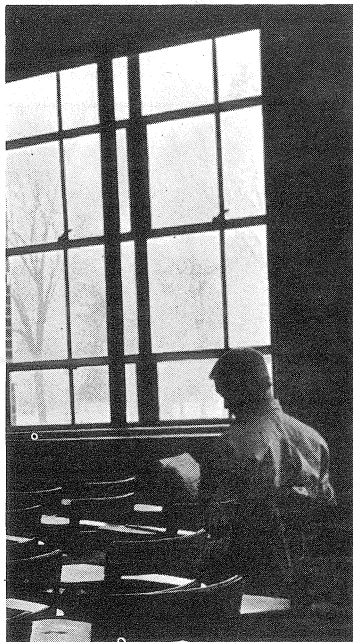
University Requirements	Credits	
English Composition 150, 250, 350	9	
Required Physical Education (6 quarters)	6	15
Major Requirements		
Chemistry 101-102	8	
Physics 111	5	
Zoology 111, 202	10	
Sociology, 101, 102	10	
Psychology 110, 361	10	
Speech 111	3	
Speech Pathology and Audiology 330	3	
Microbiology 100, 102	6	
Mathematics 116, 117	10	
Physical Education 240, 290, 380, 385, 386, 388, 390, 399, 460, 465, 478, 486, 585	41	
General 151, 152, 153	9	
Elect 3 credits other than Gen 151-152-153, from Group IV	3	
Elect an additional course in Physical Science	5	
Elect 2 credits, other than Soc 101, 102, from Group III	2	
Home Economics 146	4	129
School of Physical Therapy		
Forty-five hours of credit	45	45
		189

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.

$$E=Mc^2$$

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 geometry. It is also recommended that the high school preparation include advanced algebra, solid geometry, and trigonometry.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PHYSICS. In addition to the general requirements for graduation listed earlier in the catalog, fifty-five credits in physics must be earned for the Bachelor of Arts degree with a major in physics. In preparation for advanced courses, a student should take Physics 221-222-223 in the sophomore year. Required courses offered in other departments: Mathematics 116, 117, 118, 251, 252, 253; Chemistry 121-122-123. The foreign language requirement listed earlier in the catalog must be satisfied.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

111-112-113 **GENERAL PHYSICS 5 (5-3)** prereq for 111: Math 117, 111 is prereq for 112 and 113, but 112 is not prereq to 113. (111) Mechanics and wave motion. (112) Heat, electricity and magnetism. (113) Sound, light and atomic physics. Credit not allowed for both 111-112-113 and 221-222-223.

131-132 **INTRODUCTION TO ASTRONOMY 2 (2-0)** prereq high school trigonometry or c/i. Lecture, observation, and problems.

221-222-223 **GENERAL PHYSICS 5 (6-4)** prereq for 221: Math 118 or 152. 221 is prereq for 222 and 223, but 222 is not prereq to 223. This course satisfies medical and technical school requirements in general physics. (221) Mechanics and wave motion. (222) Heat, electricity and magnetism. (223) Sound, light, and atomic physics.

251-252-253 **LABORATORY ARTS 1 (0-3)** prereq 223. Open to upper division science majors who have completed 223. Enter any quarter. Elements of glass blowing, machine shop practice, and electronic construction techniques.

FOR UNDERGRADUATES AND GRADUATES

301 (271) **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)** prereq 223 and Math 252.

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 and one year of calculus.

346-347-348 **HEAT, THERMODYNAMICS, STATISTICAL MECHANICS 3 (3-0)** prereq 223 and Math 253.

361 **SOLAR SYSTEM AND DYNAMICAL ASTRONOMY 3** prereq 221 and Math 253.

362 **ASTRONOMICAL ORBITS 3** prereq 223 and Math 253. Methods of calculation of orbits of planets and comets, and visual, spectroscopic and eclipsing binary stars.

363 **STELLAR ASTRONOMY AND ASTROPHYSICS 3** prereq 362.

371-372-373 (471-472) **MECHANICS 3 (3-0)** prereq 301 and Math 253.

431 **SELECTED TOPICS V 1-5 R-10** prereq c/i and 15 credits in Physics.

441-442 **ADVANCED LABORATORY 2 (1-2)** prereq or coreq 223, 353, 314. Experiments in fields of current progress in physics, requiring individual student study and initiative.

452-453 (352-353) **ATOMIC PHYSICS 3 (3-0)** prereq 223 and Math 252.

454 (354) **NUCLEAR PHYSICS 3 (3-0)** prereq 353.

473 **QUANTUM MECHANICS 3 (3-0)** prereq 472.

480 **PHYSICS SEMINAR 1 (1-0).** A library and discussion course required of Physics majors.

FOR GRADUATES

501 **RESEARCH V 2-10 R-15** prereq c/i.

552 **RADIATION AND ATOMIC STRUCTURE 5 (5-0)** prereq 353.

554-555 **QUANTUM MECHANICS 5 (5-0)** prereq 353 and 473.

699 **THESIS V R-15.**

POLITICAL SCIENCE

is the study of government and politics both in their domestic and international aspects. By meeting requirements outlined below, a student may earn a Bachelor's degree in Political Science, in Political Science and Economics, or in Political Science and History. A Master of Arts degree in Political Science is also offered.

Courses offered in the Political Science department are designed to aid students in attaining the following objectives:

- (1) To assist all students in securing a broad liberal education and to equip them with the foundations for effective discharge of the duties of American citizenship;
- (2) To provide undergraduate preparation for those students who propose to continue the study of Political Science at the graduate level with the ultimate goal college teaching and research;
- (3) To offer a broad program of training for those students who plan careers in government or politics, including training for both the foreign service and the domestic public service at the national, state and local levels;
- (4) To assist in preparing students for careers in teaching at both the elementary and secondary levels;
- (5) To provide a sound background for those students who intend to enroll in law and other professional schools.

The major fields of Political Science emphasized are American Government and Politics, Comparative and Foreign Government, International Relations, Organization and Law; and Political Theory.

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 degree with a major in Political Science: a minimum of 45 credits in Political Science with 30 credits from courses numbered over 300.

A student who wishes to major in Political Science should consult with a member of the Political Science staff before the end of his 6th quarter about a proposed course program which will satisfy the 45-hour minimum requirement.

Courses required of all Political Science majors are Political Science 201-202 or Political Science 201 and Economics 201-202; Political Science 231, 351, 495 and one course in comparative government. Majors will also take at least one additional course numbered 300 or above in American Government and in International Relations.

A student may offer a combination major in Political Science and History with a minimum of 60 credits selected from the two disciplines of which at least 20 credits must be in Political Science and 20 credits in History. A minimum of 30 credits must be selected from courses numbered over 300.

A student may offer a combination major in Political Science and Economics with a minimum of 60 credits selected from the two disciplines; at least 27 credits must be in each discipline. Required courses are: Political Science 201, 202; and Economics 201, 202, 203, 301, and 311. At least 12 additional credits will be chosen from upper division economics courses and 18 additional credits from Political Science. Twelve hours of the Political Science work must be in upper division courses.

Either the completion of five quarters of a foreign language or the demonstration of a satisfactory reading knowledge of historical, legal or political science materials in such a language is required. With the consent of the Chairman of the Department the student may fulfill the language requirement by completing three quarters in each of two languages.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

101 INTRODUCTION TO POLITICAL SCIENCE 3. Issues and problems confronting the political system and the systematic study of politics as a discipline.

102 ELEMENTS OF LAW 2 prereq or coreq 101. Law as a system of social control; legal systems and law-making institutions.

201 (202) AMERICAN GOVERNMENT 5. Constitutional principles of the national government; democratic political processes, including public opinion, interest groups, political parties, and elections; structure of the national government, congress, the presidency, and the courts.

202 (203) AMERICAN GOVERNMENT 3 prereq 201. Functions of the national government, including finance, business, labor, agriculture, conservation, welfare, national defense, foreign policy, and selected problems of public policy.

203 GOVERNMENT IN MONTANA 2 prereq 201. A survey of state and local governmental institutions, services, and intergovernmental relations in Montana. May be taken concurrently with 202.

231 INTRODUCTION TO INTERNATIONAL RELATIONS 3 prereq 101 or 201. Introduction to the nation-state system; development and organization of nation-states, blocs, international organizations; factors affecting stability and change in the system.

FOR UNDERGRADUATES AND GRADUATES

321 COMPARATIVE GOVERNMENT AND POLITICS 5 prereq 201. Structure and politics of democratic forms of government other than the United States, with emphasis on the parliamentary and modified parliamentary types of government in Great Britain and France.

322 COMPARATIVE GOVERNMENT AND POLITICS 3 prereq 321. Structure and politics of authoritarian and dictatorial forms of government with emphasis on the Soviet Union.

325 POLITICS OF LATIN AMERICA 3 prereq 231. Structure of politics, government and authority in the developing area of Latin America.

326 POLITICS OF AFRICA 3 prereq 231. Structure of politics, government and authority in the developing area of Africa.

327 POLITICS OF ASIA 3 prereq 231. Structure of politics, government and authority in the developing area of Asia.

331 THEORIES OF INTERNATIONAL RELATIONS 3 prereq 231. Survey of basic concepts and theoretical approaches to international relations and their application to selected problems.

332 (331) INTERNATIONAL ORGANIZATIONS 3 prereq 231. The machinery of international cooperation with particular reference to the United Nations.

335 UNITED STATES FOREIGN POLICY FORMATION 3 prereq 202 and 231. Forces and institutions shaping United States foreign policy. Relationships between domestic and foreign policy. Structure and process of United States foreign policy decision making.

341 (241) POLITICAL PARTIES 3 prereq 201. Nature and organization of political parties; conduct of nominations and political campaigns; role of parties in various political systems, with special emphasis on the American system.

342 (341) POLITICAL INTEREST GROUPS 3 prereq 341 or c/i. Interest groups in the political system; interaction of interest groups with public opinion, political parties, legislative bodies, executives, administrators, and the courts.

343 VOTING BEHAVIOR 3 prereq 341. The electorate and the election process; attitudes and behavior of voters; the significance of election results for the political system.

351 CLASSICAL POLITICAL PHILOSOPHY 3 prereq 101 or any 200 level course in Political Science. An exposition and critical analysis of the major political philosophers from Plato to Aquinas.

352 EARLY MODERN POLITICAL THEORY 3 prereq 101 or any 200 level course in Political Science. An exposition and critical analysis of the major political philosophers from Machiavelli through Burke.

353 AMERICAN POLITICAL THOUGHT 3 prereq 201. An exposition and critical analysis of selected ideas and political thinkers relevant to political thought in the United States.

356 LATE MODERN AND CONTEMPORARY POLITICAL THEORY 3 prereq 101 or any 200 level course in Political Science. An exposition and critical analysis of the major political philosophers from Marx to the present.

361-362 PUBLIC ADMINISTRATION 3 prereq 201. (361) Legal and institutional setting of the administrative system; dynamics of organization and processes of public management. (362) Problems and techniques of administration illustrated by case materials and field investigation.

365 GOVERNMENT AND THE ECONOMIC ORDER 3 prereq 202. Government as regulator, promoter, and participant in the economic order.

381 STATE GOVERNMENT 3 prereq 202. Structure, functions, and operations of state governments; position of state governments in the federal system with Montana as an example.

383-384 LOCAL GOVERNMENT AND POLITICS 3 prereq 201. (383) Structure and processes of local government. (384) Policies and problems of urban areas; field investigation.

387 LEGISLATIVE PROCESS 3 prereq 201. Structure, politics, personnel and processes of national and state legislative bodies.

388-389 LEGISLATIVE PROCESS (Offered Winter and Spring quarters of legislative years.) 3 prereq 387 or c/i. Structure, processes, and politics of Montana Legislative Assembly; visits to the state legislature. (389) 2. Research topics on selected aspects of the legislative process.

395 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.

429 COMPARATIVE MARXIST THEORY 3 prereq 12 credits in Political Science or c/i. Analysis of relevant writings of major Marxist thinkers in selected countries.

433 (333) INTERNATIONAL LAW 3 prereq 332. The law of nations in relation to peace, war, and collective security.

471-472 THE AMERICAN CONSTITUTIONAL SYSTEM 3 prereq 201. (471) The courts, judicial review and the federal system. (472) Judicial protection of civil rights.

474 PUBLIC LAW OF MONTANA 3 prereq 471 or 381. The Montana Constitution as an instrument of government, and selected problems in its judicial interpretation.

491 (391) INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-9 prereq 12 credits in Political Science courses numbered above 300 and c/i. Research in fields appropriate to the needs and objectives of the individual student.

495 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

587-588-589 SEMINAR IN URBAN STUDIES 3. Selected topics in urban affairs. (Also listed as Soc. 587-588-589.)

591 INDEPENDENT STUDY IN POLITICAL SCIENCE V 2-4 R-9. Research in fields appropriate to the needs and objectives of the individual student.

592 SEMINAR IN COMPARATIVE GOVERNMENT AND POLITICS 3.

593 SEMINAR IN INTERNATIONAL RELATIONS 3.

594 SEMINAR IN POLITICAL BEHAVIOR 3.

595 SEMINAR IN POLITICAL THEORY 3.

596 SEMINAR IN PUBLIC ADMINISTRATION 3.

597 SEMINAR IN PUBLIC LAW 3.

598 SEMINAR IN STATE AND LOCAL GOVERNMENT 3.

699 THESIS V R-15.

Aptitude Test. Superior scholarship is of importance since medical and dental schools have more applicants than they can accept for admission.

HIGH SCHOOL PREPARATION. High school students who are contemplating a career in the Pre-medical Sciences curriculum at the University should plan on a program of high school studies which will include 3-4 years of mathematics, some Latin or several years of a modern foreign language, experience in Chemistry and Physics, and considerable background in literature and social science.

PRE-MEDICAL SCIENCES STUDENT. The majority of medical schools now expect a broad background of knowledge, experience, and training on the part of applicants. The field in which a student receives his Bachelor's degree is not important provided he has the minimal course requirements in the Pre-medical Sciences, demonstrates a high level of competency, and is relatively well balanced.

Applicants for entrance to Schools of Medicine exceed the number that are admitted so 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. However, he should make sure that he can satisfy within the time available (1) the University requirements for graduation, (2) the minimum pre-medical science requirements listed below, and (3) the major requirements in his chosen major field. The student should consult with the pre-medical sciences adviser during the freshman year, and consult with both the pre-medical sciences adviser and the major adviser beginning not later than the sophomore year in residence.

The Western Interstate Commission for Higher Education was designed to provide financial aid to Medical, Dental, Veterinary Medical, and other professional students attending Western professional schools.

MINIMUM COURSE REQUIREMENTS FOR THE PRE-MEDICAL SCIENCES STUDENT. English, Physical Education, Group, and other University requirements listed earlier in the catalog; Chemistry through Organic, Quantitative, and Survey of Physical; one year of college mathematics; one year of college physics; Zoology through Embryology and Genetics; a reading knowledge or 23 credits in French, German or Russian.

SPECIAL REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE WITH A MAJOR IN THE PRE-MEDICAL SCIENCES: In addition to the minimum course requirements listed immediately above the student must take Psychology 5-10 credits; 15 credits of an approved course of study in one field; and additional electives selected from the non-sciences to complete University credit requirements for graduation.

It is possible for the Pre-medical Sciences student who has satisfied course requirements specified above to earn a Bachelor's degree in some other field than Pre-medical Sciences. A degree in a related field such as Chemistry, Mathematics, Microbiology or Zoology may be earned by completing course work in the area selected as approved by the Chairman of the major department concerned. See Chemistry and Zoology for degrees in those areas with the Pre-med Option.

PRE-MEDICAL SCIENCES

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 a Bachelor of Arts 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

PRE-MEDICAL SCIENCES CURRICULUM

(Dentistry, Medicine, Veterinary Medicine)

Freshman Year			
	A	W	S
	Cr.	Cr.	Cr.
Engl 150	3		
Math 116, 117, 118	5	5	5
Chem 121-122-123	5	5	5
(Math 251 elective)			5
Electives	4	3	
H&PE (see below)			
Sophomore Year			
Engl 250		3	
Zool 111, 112, 113	5	5	5
Chem 261, 262	5	5	
Psych 110			5
For Lang 101 or elective	5		5
Group requirements		3	
H&PE see below)			
Junior Year			
Engl 350			3
Chem 245, 370		5	5
Physics 221, 222, 223 or 111, 112, 113	5	5	5
Zool 304	5		
For Lang or elective	5	5	4
Senior Year			
Zool 404, 485	5	5	
For Lang or elective	5	5	5
Science sequence, Chem 481 recommended	5	5	5
Elective			5
			183
H&PE (6 quarters)			6
			183

PRE-NURSING

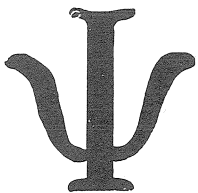
The School of Nursing at Montana State University, Bozeman, accepts transfer students from the University of Montana who have completed one of two Pre-Nursing programs listed below. (The three-quarter sequence is intensive and is recommended for only the best students.) Students with sophomore standing who desire admission to the School of Nursing, Montana State University, Bozeman, must plan to enter during Summer Quarter after completion of their freshman year. Students with sophomore standing wishing admission to a school of nursing other than that of Montana State University should consult the catalog of the school of their choice for the selection of a freshman program.

	Su Cr.	A Cr.	W Cr.	S Cr.
Four-quarter sequence:				
Chem 101-102—General Chemistry		4	4	
Engl 150—Freshman Composition	3			
Home Ec 146, 366—Elementary Nutrition, Child Development			4,3	
H&PE 100—Physical Education		1	1	1
H&PE 290—Human Anatomy			5	
Math 116—College Algebra		5		
Micro 100—Elementary Microbiology				3
Psych 110, 220—Introduction to Psychology, Psychology Statistics		5		5
Soc 101—Introductory Sociology	5			
Speech 111—Introduction to Public Speaking	3			
Zool 202—Human Physiology				5
	11	15	17	14

	Su Cr.	A Cr.	W Cr.	S Cr.
Three-quarter Sequence:				
Chem 101-102—General Chemistry		4	4	
Engl 150—Freshman Composition	3			
H&PE 100—Physical Education		1	1	1
H&PE 290—Human Anatomy			5	
Home Ec 146, 366—Elementary Nutrition, Child Development			4,3	
Micro 100—Elementary Microbiology		3		
Psych 110—Introduction to Psychology		5		
Soc 101—Introductory Sociology				5
Speech 111—Introduction to Public Speaking				3
Zool 202—Human Physiology				5
		16	17	14

PSYCHOLOGY

is the science concerned with principles of behavior of living organisms. It deals with such processes as learning, motivation, emotion, perception, problem solving, personality, intelligence and group behavior.



The Bachelor of Arts, Master of Arts, and Doctor of Philosophy degrees are offered.

Minimum preparation for professional work in psychology requires an M.A. degree, and full professional competence requires the Ph.D. degree. The fully trained student may select from a variety of positions in laboratories, clinics, hospitals, schools and colleges, business and industry, and governmental agencies. At present and in the foreseeable future, the number of jobs far exceeds the number of trained psychologists who can fill them.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN PSYCHOLOGY. 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 psychology: at least 45 credits in psychology, including Psychology 110, 220, 310, 311 and 411, with at least 25 credits in psychology courses numbered above 299, including at least 2 credits of 390 in the senior year. Mathematics 125; Zoology 111-112-113, or 111 and 202; and a reading knowledge or five quarters (25 to 25 credits) in one modern language, preferably Russian, German or French. Other courses recommended for psychology majors include Philosophy 110 and 210. Mathematics 116, 344 and 345, Speech 111, Anthropology 153 and at least one course in Sociology. For majors preparing for graduate work in psychology, the following departmental courses are recommended in addition to those which are required: Psychology 206, 212, 230, 240, 312, 361. With appropriate background, such students may take a restricted number of graduate level courses in their senior year.

RECOMMENDED COURSE SEQUENCE

Freshman Year

	A Cr.	W Cr.	S Cr.
Psych 110	5		
For Lang 101-102-103	5	5	5
Zool 111-112-113	5	5	5
Soc 101		5	
Engl 150			3
Psych 190 or electives			3
H&PE	1	1	1
	16	16	17

Sophomore Year

	A Cr.	W Cr.	S Cr.
Psych 220		5	
Psych 206, 212, 230, 240 (take 2)	5		5
For Lang 211-212	5	5	
Speech 111			3
Philosophy 110	5		
Engl 250		3	
Anthro 153			5
Electives		2	3
H&PE	1	1	1
	16	16	17

Junior Year

	A Cr.	W Cr.	S Cr.
Psych 310, 311	5	5	
Psychology electives (206, 212, 230, 240, 312, 361, 390)	0-5	5-8	5-8
Math 116, 302, 303 (or electives)	5	5	5
Philosophy 210			5
Engl 350	3		
	15-17	15-18	15-18

Senior Year

	A Cr.	W Cr.	S Cr.
Psych 411	5		
Psych 390		3	3
Psychology Electives (400 level)	0-5	0-5	0-5
Electives	5-8	7-10	7-10
	10-18	10-18	10-18

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For explanation see Course Descriptions (Index)

110 INTRODUCTION TO PSYCHOLOGY 5 (5-0). Introduction to the scientific study of behavior in man and animals, with emphasis on psychological processes such as sensation, perception, learning, motivation, etc.

111 INTRODUCTION TO EXPERIMENTAL PSYCHOLOGY 5 (4-2) prereq 110. Advanced general psychology. Experimental and quantitative methods employed in laboratory approaches to the scientific study of behavior.

190 PSYCHOLOGICAL INVESTIGATION V 1-3 R-5 prereq 110 and c/i. Supervised investigation of psychological problems.

206 COMPARATIVE PSYCHOLOGY 5 (4-2) prereq 111. The origins and significance of the behavior of present life forms.

212 (412) PHYSIOLOGICAL PSYCHOLOGY 5 (4-2) prereq 111. Survey of basic chemical and nervous regulatory mechanisms underlying behavior.

220 PSYCHOLOGICAL STATISTICS 5 (4-2) prereq 110 and Math 125. Application of statistical techniques to psychological data.

230 CHILD AND ADOLESCENT PSYCHOLOGY 5 (5-0) prereq 110. Behavioral development through adolescence, with emphasis on the research literature.

240 SOCIAL PSYCHOLOGY 5 (4-2) prereq 111. Effects of social environment upon human behavior.

390 (490) PROBLEMS IN PSYCHOLOGY V R-9 prereq 15 credits in Psychology and c/i.

FOR UNDERGRADUATES AND GRADUATES

310 SENSORY PROCESSES AND PERCEPTION 5 (4-2) prereq 111. Concepts, principles and methods of sensory function and perceptual phenomenon.

311 LEARNING 5 (4-2) prereq 111. Principles involved in modifying behavior.

312 MOTIVATION 5 (4-2) prereq 111. Conditions which influence basic drives, incentives, and the development of complex motives.

342 PERSONNEL PSYCHOLOGY 3 (3-0) prereq 110. Selection, classification, and training; worker efficiency and adjustment problems.

343 INDUSTRIAL PSYCHOLOGY 5 (5-0) prereq 110. Applications of psychology in industry.

361 ABNORMAL PSYCHOLOGY 5 (5-0) prereq 110. Description and classification of psychopathological reaction patterns, with emphasis on their psychological dynamics.

411 SYSTEMATIC PSYCHOLOGY 5 (5-0) prereq 310-311. Evaluation of the major psychological systems: Structuralism, Functionalism, Behaviorism, Gestalt, Psychoanalysis.

420 (360) PERSONALITY DYNAMICS 4 (4-0) prereq graduate standing or senior with c/i. Principles of motivation, frustration, conflict, and the mechanisms for defense. Major emphasis on psychoanalytic dynamics.

451 INDIVIDUAL DIFFERENCES 3 (3-0) prereq 110. Nature and extent of individual and group differences.

480 MATHEMATICAL MODELS IN PSYCHOLOGY 4 (4-0) prereq 220 and 311 or c/i. Derivation and evaluation of some of the less complex models of learning, choice behavior, and signal detection.

491 TOPICAL SEMINAR V R-6 prereq 15 credits in psychology and c/i. Topics of current interest with critical examination of the literature.

FOR GRADUATES

501-502-503 PROSEMINAR 3 prereq graduate standing in psychology. The basic science fields of psychology, designed as a foundation for advanced training in specialized areas of general and applied psychology. Required of all graduate students in psychology. (501) Learning, motivation, and thought processes. (502) Perception, physiological psychology, comparative psychology. (503) Personality, psychopathology, social psychology.

505 (505-506-507) 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 (410) HISTORY AND SYSTEMS OF PSYCHOLOGY 4 (4-0) Development of concepts, systems, and theories in psychology.

512 THEORIES OF LEARNING 4 (4-0). Critical review of current learning theories based on analysis of fundamental concepts, experimental data, and theoretical implications.

513 ADVANCED LEARNING 4 (4-0). Principles and methods pertaining to the acquisition and retention of new behaviors.

514 (414) THOUGHT PROCESSES 4 (4-0) prereq 10 credits from 310, 311, 312 and 220. Experimental and theoretical analysis of problem solving, concept formation, and other complex symbolic behavior.

515 ADVANCED MOTIVATION 4 (4-0). Drive, incentive and other affect variables as they influence performance.

516 ADVANCED COMPARATIVE 4 (4-0) Directed towards a synthesis of existing data from various life forms into universal principles of behavior.

518 LABORATORY INSTRUMENTATION 4 (2-4). Discussion and experience in the design, construction, and use of instrumentation in psychology.

521-522 (511) ADVANCED PSYCHOLOGICAL STATISTICS 4 (4-0). Application of statistical procedures to the design of experiments; assumptions underlying techniques of sampling and measures of association and significance.

530 ADVANCED CHILD PSYCHOLOGY 4 (4-0). Selected topics in learning and motivation of children with emphasis on analysis of experiments and theoretical interpretations.

540 INTERVIEW AND CASE HISTORY TECHNIQUES 2 (1-2). Interpersonal dynamics in the gathering of personal data from individuals. Organization and presentation of case history reports in educational, industrial and clinical situations.

544 (444) ADVANCED SOCIAL PSYCHOLOGY 4 (4-0). Theory and experiment in the analysis of individual behavior in relation to social stimuli.

550-551-552 (571-572, 576-577) PSYCHOLOGICAL EVALUATION 4 (3-2) prereq c/i. Administration, scoring, and interpretation of standard tests, with supervised practice. (550) Individual and group tests of aptitudes and intellectual abilities. (551) Objective measures of personality functioning; introduction to projective techniques, TAT and related tests. (552) Rorschach and other projective approaches.

560 (460) THEORIES OF PERSONALITY 4 (4-0). Current theories of personality and the experimental evidence on which they are based.

561 ADVANCED PSYCHOPATHOLOGY 4 (4-0). Symptoms, etiology, diagnostic criteria and treatment of the major functional and organic disorders; research literature.

562 ADVANCED PERCEPTION 4 (4-0). Current literature and theoretical models of perception.

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 and research.

586 PRINCIPLES OF PSYCHOTHERAPY 4 (4-0) prereq 561. Major theoretical and technical approaches to psychotherapy.

590 INDEPENDENT RESEARCH V R.

599 THESIS V R-10.

600 TOPICAL SEMINAR V 1-3 R. Advanced treatment of highly specialized topics of current interest.

601 SEMINAR IN MEASUREMENT V 1-3 R. Selected topics from the field of measurement and quantitative methods in psychological research.

602 SEMINAR IN EXPERIMENTAL V 1-3 R. Survey of current literature dealing with selected aspects in learning motivation, sensory processes, and perception.

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. The study of significant research investigations in psychopathology, diagnosis, psychotherapy and other related aspects of clinical psychology.

605 SEMINAR IN PHYSIOLOGICAL AND COMPARATIVE V 1-3 R. Selected topics in physiological and comparative psychology from the recent literature. Extensive work in the original literature.

606 SEMINAR IN PERSONALITY AND SOCIAL V 1-3 R. Selected topics in personality or social psychology.

671 CLINICAL PRACTICUM, DIAGNOSTIC 2 (0-4) R-6 prereq c/i. To be taken in conjunction with or subsequent to 550-551-552. Supervised practice of diagnostic techniques in a clinical setting.

672 CLINICAL PRACTICUM, THERAPEUTIC 2 (0-4) R-6 prereq c/i. To be taken in conjunction with 686. Supervised practice of psychotherapeutic techniques in a clinical setting.

673 CLINICAL PRACTICUM, RESEARCH 2 (0-4) R-6 prereq c/i. Supervised participation in research projects in a clinical setting.

685 (689) CLINICAL INTERNSHIP 0 prereq acceptable proficiency in clinical techniques. Clinical internship offered by the psychology staff of a hospital, clinic, or other approved agency.

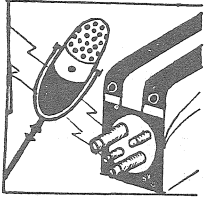
686 ADVANCED PSYCHOTHERAPY 2 (2-0) R-6 prereq 420, 586, 685; coreq 672. A continuous and intensive study of the psychotherapeutic relationship and the various therapeutic techniques including supportive, client-centered, analytic, hypnotherapeutic.

699 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 College of Arts and Sciences and the School of Journalism offer the following curriculum leading to a Bachelor of Arts degree in Radio-Television.

University Requirements	Credits		
English Composition 150, 250, 350	9		
Physical Education 100 (6 quarters)	6		
Groups I and II	15		
Group III	12		
Group IV	12		
	54	54	
Additional Requirements:			
Group III	13		
Group IV	13		
Foreign Language	23-25		
English 450	3		
	52-54	52-54	
Major Requirements:			
32 credits from Radio-Television 140, 341-342-343, 346, 348, 440, 441-442-443, 494; Drama 329 (342); Speech 241	32		
Drama 121, 131	7		
Journalism 270, 397	6		
	45	45	
Free Electives		35-33	
		186	

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

140 INTRODUCTION TO RADIO AND TELEVISION 3. Open to non-majors. History, organization, economics, social and legal responsibilities, and basic electronic theory of radio and television as media of mass communication.

341-342-343 (240, 242, 345) RADIO PRODUCTION 2 prereq 140 for 341; prereq 341 and Journ 270 for 342; prereq 342 for 343. Lectures and staff work on faculty-directed University radio station. (341) Operation of broadcasting equipment, F.C.C. 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. Planning and broadcasting of advertising campaigns. Station management and sales principles.

FOR UNDERGRADUATES AND GRADUATES

440 CINEMATOGRAPHY (see Journalism).

441-442-443 TELEVISION PRODUCTION AND DIRECTION 3 prereq 12 hours in radio-television courses. Advanced course in 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 and television and their effect on society with emphasis on responsibilities of the broadcasting industry.

RELIGION

courses of a non-sectarian nature are offered for general education purposes. Although no degree is offered in Religion, up to 15 credits in religion courses may be counted toward graduation. The instruction covers ancient and contemporary thought and scholarship of most of the major religions of the world, including the study of the Bible and the Church. No attempt is made to indoctrinate the student in beliefs or creeds.



In addition to a director (who is not sponsored by any one group), there are three Chairs of Religion. The Judaica Lectureship, chaired on a part-time basis by a Jewish professor, is sponsored by the Jewish Chautauqua Society, the Jewish community of Montana and its neighboring states. The second Chair on a full-time basis is sponsored by the Helena Diocese of the Roman Catholic Church. The third Chair also on a full-time basis is sponsored by the National Lutheran Campus Ministry (supported by the American Lutheran Church and the Pacific Northwest Synod of the Lutheran Church in America). Financial support of the program is voluntary.

The Montana School of Religion was organized and incorporated as an independent organization in 1924 for the purpose of making courses in religion available to students, and of teaching religion as an academic discipline. It is affiliated with the University, under a director who is responsible to the University and to a Board of Trustees comprised of faculty, administration, laymen, and ministers, who represent the various supporting groups and the University.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

118 INTRODUCTORY STUDY OF RELIGION 2. Comparative analysis of truths of various disciplines, expressions of religious truths, criteria of truth, and basic problems a student must face. (Open only to freshmen and sophomores.)

123 LIFE AND TEACHINGS OF JESUS 3. The origins, background, problems, occasions, and messages of the four gospels with an attempt to relate the teaching for today.

142 RELIGION IN AMERICA 3. The teachings and practices of Judaism, Protestantism, Roman Catholicism, and other representative sects found in America.

219 SURVEY OF THE BIBLE 3. The origins, background, problems, occasions and messages of the Old and New Testaments.

224 LIFE AND TEACHINGS OF PAUL 3. The origins, background, problems, occasions and messages of ten epistles of Paul the apostle and of the book of Acts, and their application for today.

241 HISTORY OF CHRISTIANITY TO 900 3. An historical-cultural approach to the major movements of the Church from the Apostolic period through the Carolingian Renaissance; reciprocal influences of politics, economics, social mores, and the arts with the Church.

242 HISTORY OF CHRISTIANITY FROM 900 TO 1700 3. The growth and role of Christianity in the West; the causes and establishment of the Reformation; the influences of monasticism, rising nationalism, and humanism upon the Church.

250 BASIC CHRISTIAN CONVICTIONS 3. The backgrounds and thoughts concerning God, man, sin, Jesus Christ, and redemption interpreted in meaningful terms for our day.

251 CHRISTIAN THINKERS BEFORE 1800. 2. The contributions of Augustine, Aquinas, Luther, and Calvin through study of their writings.

252 MODERN RELIGIOUS THINKERS 2. The contributions of Kierkegaard, Buber, Marcel, Berdyaev, and Tillich through study of their writings.

320 THE PROPHETS AND THEIR TIMES 3. The Hebrew prophets Isaiah, Jeremiah, Ezekiel, and twelve others from the biblical writer's point of view and related to today.

330 PRINCIPLES OF RELIGIOUS EDUCATION 2. The objectives and curricula of the religious education of a person in relationship to home, school, university, and place of worship, according to his particular religious culture.

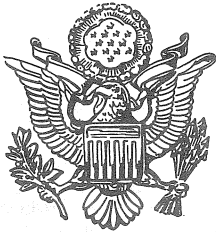
350 ARCHAEOLOGY AND THE BIBLE 3. The Dead Sea Scrolls of 1947, 1959 (Bar-Kochba Letters), and 1964-65 (Masada Scrolls), the Negev Explorations, Bet Shearim necropolis, and others.

FOR UNDERGRADUATES AND GRADUATES

304 COMPARATIVE WORLD RELIGIONS 5. Seven to eight living religions of the world, their historical sequence and philosophical and theological affirmations.

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 Force officer. Their purpose is to qualify for commissions those college men who desire to serve in the United States Air Force. The commission is tendered upon satisfactory completion of either program and being awarded a degree from the University.

The four-year program requires completion of aerospace studies, during four years of attendance at the University. Also a four-week Training Unit is required upon completion of the junior or third year of AFROTC. The two-year program encompasses Aerospace Studies during the junior and senior or last two years at the University. In addition a six-week Field Training Course is required during the summer immediately prior to enrollment in the two-year program. Completion of the appropriate summer training is a prerequisite for receiving a Reserve Commission in the United States Air Force. A monthly retainer fee (currently \$50) is paid to cadets formally enrolled in Aerospace Studies 300 and 400 series. A number of Financial Assistance Grants are available at colleges and universities within the United States for students enrolled in the four-year program. Further information may be obtained from the Professor of Aerospace Studies.

FOUR-YEAR PROGRAM

BASIC COURSE: GENERAL MILITARY EDUCATION PROGRAM

The academic requirements of the basic courses autumn and spring quarters of the freshman year and winter quarter of the sophomore year will be met through enrollment in any group requirement with the exceptions of Art, Drama, Music or Religion courses.

101-102-103 WORLD MILITARY SYSTEMS 2. The U.S. Department of Defense and the doctrine, mission and functions of the U.S. Air Force. Nature and principles of war; factors of national power; organization of the Department of Defense. Background and organization of the U.S. Air Force; strategic offensive and defensive forces. One hour classroom and one hour Corps Training each week.

201-202-203 WORLD MILITARY SYSTEMS 2. Department of Defense general purpose forces. Employment of the U.S. Air Force in coordination with forces of the U.S. Army and Navy. Tactical Air forces and operations; special warfare and counterinsurgency; Aerospace support forces. Collective security organizations. Trends and implications of world military power; the search for peace. One hour classroom and one hour Corps Training each week.

ADVANCED COURSE: PROFESSIONAL OFFICER COURSE

In the four year program, completion of the Basic Course is a prerequisite for admission into the advanced course. In addition the cadet must enlist in the Air Force Reserve (this enlistment may be canceled if student withdraws from the University or for other specific reasons), pass a physical examination and the Air Force Officer Qualifying Test.

301-302-303 GROWTH AND DEVELOPMENT OF AEROSPACE POWER 3. (301) The development of airpower from the beginnings of manned flight to 1961. (302) Aerospace Power today, the future of manned aircraft, and history of astronautics and space operations. (303) Vehicle systems and operations. The future of astronautics and space operations. Attention is devoted to developing the communicative skills needed by officers. Corps training includes experience as junior officers in the Cadet Corps.

304 SUMMER TRAINING UNIT No Credit. Four weeks at an Air Force Base after completion of Aerospace studies 301-302-303. Organization and functions of an Air Force Base, air crew and aircraft indoctrination, officer orientation, military fundamentals, physical training and individual weapons.

401-402-403 THE PROFESSIONAL OFFICER 3. (401) Foundations and responsibilities of the military profession and the military justice system. Practical work as Cadet officers in staff and command positions, with primary responsibility for the preparation and conduct of cadet Corps training program. Three class hours and one hour of Corps Training per week. (402) Leadership and management in the Air Force emphasizing theories of leadership, human relations and principles and functions of management. Three class hours and one hour Corps Training per week. (403) Leadership and management in the Air Force emphasizing communicative skills, problem solving and preparation for active duty with the United States Air Force. Practical work as Cadet officers in staff and command positions, with primary responsibility for the preparation and

conduct of cadet Corps Training program. Three classroom hours and one hour of Corps Training per week. Flight Training is offered to qualified students concurrent with 401-402-403. Successful completion leads to FAA Private Pilots License and entry into the U.S. Air Force Pilot Training program.

TWO YEAR PROGRAM

The two year program requires attendance at one summer training session and the two years of the advanced Course, AFROTC. Admission into the Advanced Course under this program does not require the two basic years of AFROTC as a prerequisite. In lieu of that, a six week summer training session at an Air Force Base is required during the summer immediately prior to entering the Advanced Course. Following that initial summer training period, the Advanced Course is identical to the four year program except field training between Junior and Senior year is not required. Students interested in acquiring a commission in the United States Air Force Reserve through the two year program should consult the Professor of Aerospace Studies not later than fall quarter of their sophomore year.

250 FIELD TRAINING COURSE No Credit. Prerequisite for entry into Advanced Course. Six weeks at an Air Force Base. Stressing drill, military fundamentals, physical training and Air Force orientation.

301-302-303 GROWTH AND DEVELOPMENT OF AEROSPACE POWER 3. (Same as for the four year program.)

401-402-403 THE PROFESSIONAL OFFICER 3. (Same as for the four year program.)

MILITARY SCIENCE

The Department of Military Science offers a two and a four year program leading to a commission in the United States Army Reserve. The commission is tendered upon satisfactory completion of either program and university requirements for a baccalaureate degree.

The four year program requires completion of Military Science courses during four years of attendance at the University. In addition, a six-week summer camp is required 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 summer camp upon completion of the junior year of ROTC. However, as a prerequisite to beginning this course, the student must attend a six-week summer camp following the sophomore year. A monthly retainer (currently \$50) is paid to cadets enrolled in Military Science 300 and 400 series. An option flight training program for qualified cadets is offered during the last year of ROTC training. A limited number of scholarships are available for students enrolled in the four year program. Further information may be obtained from the Professor of Military Science.

FOUR YEAR PROGRAM

BASIC COURSE: GENERAL MILITARY EDUCATION

101-102-103 INTRODUCTION TO THE ARMY 2. (101) An introduction to the organization of the Army and an evaluation of Military Weapons Systems. Leadership, drill and command, basic and progressive training in leadership through practical exercise in drill, ceremonies and military customs and courtesies. (102) National Security and the United States Army with emphasis on the Army's role as part of the National Defense Team. Continuation of leadership, drill, and command. (103) Continuation of National Security and the United States Army. Introduction to Military First Aid. Continuation of leadership, drill and command.

201-202-203 ADVANCED INDIVIDUAL TECHNIQUES 2 prereq 101-102-103. (201) A survey of American Military History from the origins of the American Army to the present with emphasis on the factors which lead to organizational, tactical, logistical, operational, strategic and social patterns found in our present-day Army. Leadership, drill and command with emphasis on the duties and responsibilities of the junior leaders. (202) Topographical recording techniques with emphasis on the use of military maps. Continuation of leadership, drill and command. (203) Principles of tactics and operations of the U. S. Army with emphasis on small unit activities. Continuation of leadership, drill and command.

ADVANCED COURSE: OFFICER TRAINING

In the four year program, completion of the Basic Course is a prerequisite for admission to the Advanced Course. An applicant must pass a physical examination and the mental screening test prescribed by Department of the Army. Further, he must be recommended by both the President of the University and the Professor of Military Science. In addition, the student is required to enlist in the U. S. Army Reserve. This enlistment may be canceled if the student withdraws from the University or for other specific reasons.

301-302-303 PRINCIPLES AND TECHNIQUES OF THE MILITARY LEADER 3. (301) Principles and techniques of the military leader with emphasis on problems of leadership and military teaching methods. Leadership, drill and command to include practical work in instructing and directing military drill of individuals and small units. (302) Army Communications Systems and its application in small unit operations. Continuation of leadership, drill and command. (303) Principles and techniques of tactical operations with emphasis on small unit operations. Continuation of leadership, drill and command.

304 SUMMER CAMP. No credit. Six weeks at an Army Training Center taken after completion of 303. Practical military training and tactical exercises with emphasis on the development of discipline and leadership. Student is reimbursed to and from camp for travel performed at a rate of 6¢ per mile, and receives pay of \$27.80.

401-402-403 **MILITARY MANAGEMENT 3** prereq 301-302-303. (401) Military administration and logistics with emphasis on duties and functions of staff officers. Leadership, drill and command with practical application and exercises designed to develop the junior officer. (402) Military Tactical Operations and introduction to Military Law. Continuation of leadership, drill and command. (403) A survey of the United States in World Affairs. Continuation of leadership, drill and command.

404 **FLIGHT TRAINING.** No credit. This elective is offered to selected qualified students concurrent with 401, 402, and 403. Successful completion of course leads to FAA private license and assignment to Army Aviation duty upon graduation.

TWO-YEAR PROGRAM

The two year program requires attendance at two summer camps and the two years of the Army ROTC Advanced Course. Admission into the Advanced Course under this program does not require the two years of Basic ROTC as a prerequisite. In lieu of that, it is required that a student complete a six-week summer camp at a U. S. Army training facility during the summer immediately prior to entering the Advanced Course. Following this initial summer camp, the Advanced Course is identical to the four year program. Students interested in acquiring a commission in the U. S. Army through the two year program should consult the Professor of Military Science no later than winter quarter of their sophomore year.

250 **SUMMER CAMP** No credit. Prerequisite for entry into Advanced Course. Six weeks at a U. S. Army facility. Training consists of leadership and military fundamentals, physical training, and U. S. Army orientation. Student is paid at the monthly rate of \$90 during the camp period.

301-302-303 **PRINCIPLES AND TECHNIQUES OF THE MILITARY LEADER 3.** (Same as for the four year program.)

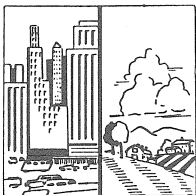
304 **SUMMER CAMP.** (Same as for the four year program.)

401-402-403 **MILITARY MANAGEMENT 3.** (Same as for the four year program.)

404 **FLIGHT TRAINING.:** (Same as for the four year program.)

SOCIAL WELFARE

explores the ways in which social problems affect people; the agencies which help people deal with these problems; and the methods used in such endeavor. Social Welfare courses involve case records and some field work or observation in addition to regular class work. Broad studies in other social sciences are required.



Those seriously considering a career in the field should plan on the two years of graduate professional training for which the course is preparatory. Social workers are employed in such positions as case-workers, group workers, supervisors and administrators in public and private social agencies, courts, hospitals, mental-health clinics and youth serving organizations.

The undergraduate major in social welfare is available for those wishing a practical orientation toward social problems. Both theory and practice are emphasized to achieve the effectiveness needed on the job. Those wishing to enter graduate schools of social work will find the program designed for this purpose as well as for effective citizen participation. Courses are selected from the several social sciences to serve as a foundation for a limited number of courses which present social welfare content and method. Group methods are freely used.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, 40 credits in departmental courses are required for the Bachelor of Arts degree with a major in social welfare. The following courses must be taken: SW 181, 371, 372, 375, and at least eight credits in SW 483, Social Work Laboratory. In addition, Soc. 101, 201, 205, and 314 must be taken.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

181 **THE FIELD OF SOCIAL WELFARE 5.** Social welfare functions. Development of modern social welfare and the distinctive features of the profession.

200 **INTRODUCTION TO SOCIAL WORK PRACTICE 4** prereq 181. Social work as a professional practice concerned with helping individuals, groups, and communities; its goals, guiding philosophy,

and basic assumptions. A review of the four major processes in social work practice: casework, group work, community organization, and social work administration.

FOR UNDERGRADUATES AND GRADUATES

371 (201) **GROUP METHODS 4** prereq 200. Purposes, principles and methods of group functioning. The role of the group worker and the group member. The problem of leadership in the group, the agency and the community.

372 (482) **COMMUNITY RELATIONS 4, Su 3 a/y** prereq 200. The place of the professional person in community life, his responsibilities as a citizen, his philosophy and ethics, especially as they relate to the community, his contributions to community welfare and his concern for human needs and problems.

373 **CASEWORK PROCESS 4** prereq 200. The purpose, philosophy, and method of social casework. Its practice as one of the major social work processes. Directed toward developing an understanding of the client, establishing and using the professional relationship, and basic interviewing and recording methods.

374 **THE ADMINISTRATIVE PROCESS IN SOCIAL WORK PRACTICE 4** prereq 200. Responsibilities of staff, executive, and board in defining and carrying out agency or department purpose and function. The roles of the administrator, supervisor, and worker in the administrative process in relation to the social, cultural, psychological, and political forces operating in social welfare administration. The relation of administration to policy making, community planning, and social action. Personnel methods and standards.

375 (488) **THE HISTORY OF SOCIAL WELFARE 5 a/y** prereq 181. The growth and development of social services in the United States with special attention given to policy questions: poverty, handicaps, sickness, emotional disorders, family breakdown, delinquency and crime, mental illness, wars, civil rights, and community development.

471-472-473 **SOCIAL WORK PRACTICE IN SPECIAL SETTINGS V R-10** prereq 181 and 10 credits in social welfare. Topic varies. The practice of social work in a specialized setting such as child welfare, corrections, family welfare services, working with people with particular handicaps, and school social work, including, in each case, examination of requisite specialized skills and knowledge, value systems, and principles of interprofessional collaboration.

483 **SOCIAL WORK LABORATORY V 2-4 R-12** prereq 181. A program of self-help project experiences in dealing with community needs and resources. Theoretical analysis of experienced situations. Learning by means of the laboratory method.

485 **ADVANCED PROBLEMS V 1-2 R-6** prereq c/i.

486 **COMMUNITY DEVELOPMENT 3 a/y** prereq 181. Community and area self help as procedures in achieving a vital balance between community needs and services. Effective use of community resources.

487 **INTERNATIONAL SOCIAL WORK 4 a/y** prereq 181. Voluntary and public programs serving people in distressed and underdeveloped areas of the world.

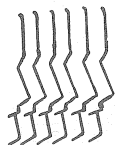
489 **SEMINAR V R-9 a/y** prereq 15 credits in social welfare.

499 **FIELD WORK PRACTICUM V R-12** prereq 15 credits in sociology and social welfare and consent of department chairman. Field work or internship, under supervision, in public and private agencies and institutions.



SOCIOLOGY

is a social science concerned with relationships which link man with his institutions and his society. Sociology is also a profession which offers various services to business, governmental, and other agencies seeking help in developing desired relationships among their members. The degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy are offered in sociology.



SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE. In addition to the general requirements for graduation listed earlier in the catalog, 50 credits in sociology courses are required for the Bachelor of Arts degree. A foreign language is required. (See foreign language requirement in the general section of the catalog.) The 50 credits in sociology must include the following courses: Soc 101, 201, 205, 310, 314, 401 and 402. In addition, the following courses in anthropology must be taken: Anth 153 and 372. Students must take Math 001 or be exempt through examination.

the general section of the catalog.) The 50 credits in sociology must include the following courses: Soc 101, 201, 205, 310, 314, 401 and 402. In addition, the following courses in anthropology must be taken: Anth 153 and 372. Students must take Math 001 or be exempt through examination.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

- 101 **INTRODUCTORY SOCIOLOGY 5.** A general study of interhuman relations.
- 102 **SOCIAL PROBLEMS 5** prereq 101. A general study of social and personal disorganization.
- 200 **AMERICAN SOCIETY 5** prereq 101. Structure and function of contemporary American society.
- 201 (303) **SOCIAL SCIENCE METHODS 3** prereq 10 credits in social sciences. The methodology, techniques and instruments of measurement used in the social sciences.
- 204 **COURTSHIP AND MARRIAGE 2.** A general consideration of factors in courtship and marriage.
- 205 **ELEMENTARY SOCIAL STATISTICS 5** prereq Math 001 or exemption by examination. Simple statistics and graphic techniques commonly used in the social sciences.
- 207 **INTRODUCTION TO SOCIAL CHANGE 5** prereq 101. Analysis of creation and development of social organizations and relationships.
- 208 (301) **INDIVIDUAL AND SOCIETY 5** prereq 101. Human development through interaction of social structure, heredity, and culture.
- 390-391-392 **PRO-SEMINAR V R-9.**

FOR UNDERGRADUATES AND GRADUATES

- 302 **SOCIAL STRATIFICATION 3 a/y** prereq 101. The class system in contemporary society in terms of social class theory, class behavior, and current research in social stratification in American society.
- 304 **POPULATION 4** prereq 101. A quantitative and qualitative analysis of world population; vital statistics and population change; migration and immigration.
- 305 (402) **THE FAMILY 5** prereq 101. Comparative, historical and analytical study of the family.
- 306 **CRIMINOLOGY 5** prereq 101 or 102. The causes, prevention, detection, and correction of crimes.
- 307 **SOCIALIZATION 3** prereq 208. Processes and products of social learning.
- 308 **RACE AND ETHNIC RELATIONS 3 a/y** prereq 101 and Anth 154. Racial and ethnic differentiation and its social consequences. (Credit not given for both Soc 308 and Anth 308.)
- 309 **INTRODUCTION TO COMPLEX ORGANIZATIONS 4** prereq 101 or Psych 110. Bureaucracies and bureaucratization in modern society.
- 310 **DEVELOPMENT OF SOCIAL THOUGHT 4** prereq 101. Social thought from earliest times to the establishment of sociology.
- 311 (S W 381) **JUVENILE DELINQUENCY 3.** Nature and extent of the problem. The role of courts, social agencies, and schools in its prevention and treatment.
- 312 (206) **URBAN SOCIOLOGY 4 a/y** prereq 101. The rise and development of cities; social organization of the city; problems of urban communities.
- 313 **RURAL SOCIOLOGY 4 Su 3 a/y** prereq 101. Organization and social relationships of rural life; the rural community, problems of rural life. Special emphasis on Montana and the Northwest.
- 314 **FIELD OBSERVATION 3** prereq 101 and 201 or 205. Interviewing procedures and social science research; guided experiences in interviewing related to actual research programs.
- 261, 362, 363 (see Health and Physical Education).
- 371 **CULTURE AND PERSONALITY** (See Anthropology)

400 **PROBLEMS IN SOCIAL ORGANIZATION V R-15** prereq 12 credits in sociology. Topics of current interest in sociology.

401 **FOUNDATIONS OF MODERN SOCIOLOGY 4** prereq 101. Selected sociological problems arising from the theories of Durkheim, Weber, and contemporary writers.

402 **INSTITUTIONAL DYNAMICS 3** prereq 207. Interrelationships of institutions in process of change.

403 **ADVANCED PROBLEMS V 1-2 R-6** prereq c/i.

404 (202) **COLLECTIVE BEHAVIOR 3 a/y** prereq 208. Theories relating to mass behavior. The characteristics of such social aggregates as crowds, mobs, and social movements.

405 **SOCIOLOGY OF WORK 5** prereq 101. Structure and function of occupations and professions. Problems of organization and relationships of work groups.

407-408-409 **SEMINAR V 2-5 R-10** prereq 10 credits in sociology. Enter any quarter.

410 **PENOLOGY 3 a/y** prereq 306. Theory and practice of penal methods in correctional institutions. Probation and parole.

499 **FIELD WORK PRACTICUM** (See Social Welfare)

FOR GRADUATES

- 501 **GRADUATE RESEARCH V R-10.**
- 502 **ADVANCED METHODS 5** prereq 201 or =. Required of all graduate students in sociology.
- 503 **ADVANCED SOCIOLOGICAL STATISTICS 5** prereq Math 125 or Soc 205. Sampling; measures of association and significance; statistical methods in the design of experiments; sociometrics.
- 504 **SOCIAL CHANGE V 2-5** prereq 101 and 10 upper division credits in sociology. Processes and consequences of social change in urban industrial society.
- 506 (411) **ADVANCED GENERAL SOCIOLOGY 4** prereq 101, 10 upper division credits in sociology. Review and analysis of major sociological theory and research.
- 507-508-509 **SEMINAR V R-15.**
- 587-588-589 **SEMINAR IN URBAN STUDIES 3.** Selected topics in urban affairs. (Also listed as Pol. Sci. 587-588-589.)
- 599 **FIELD WORK PRACTICUM V R-12** prereq 15 credits in sociology and consent of department chairman. Supervised internship.
- 607-608-609 **SEMINAR V R-15.**
- 699 **THESIS OR DISSERTATION V. R-9** for M.A.; R-15 for Ph.D.

SPEECH-COMMUNICATION

represents a discipline directly concerned with the nature and practice of communication. Study in the field is directed toward achieving a deeper understanding of the way in which people communicate with one another, and the personal, social and cultural factors that influence the process.



Three related programs of study are offered cooperatively by the Department of Speech Communication and the Department of Speech Pathology and Audiology. The student may select the particular program or combination of programs which is most relevant to his educational interests and professional goals.

The program in Foundations of Communication treats theoretical conceptions of the communicative process and their basic determinants. Research methods and procedures are emphasized. The program in Systems of Communication provides opportunity for study with emphasis on socially significant communication systems. Study and practice in Rhetoric, Public Address, Debate and Discussion exemplify the work offered in this area. The program in Disorders of Communication emphasizes the causes and remedial procedures relating particularly to disorders of speech, hearing, and language. Academic study is supplemented by extensive practicum experience in the Speech and Hearing Clinic. A more detailed description of each program, including vocational and professional opportunities will be found under each program heading below.

The Bachelor of Arts in Speech-Communication with an emphasis in either Speech Communication or Speech Path-

ology and Audiology, the Master of Arts with a major in Speech Communication or in Speech Pathology and Audiology, and the Master of Speech Pathology and Audiology degrees are offered (See Graduate School).

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREES. In addition to the general requirements for graduation listed earlier in the catalog, the student must complete a minimum of 45 credits and not more than 70 credits in Speech-Communication. All students majoring in the Speech-Communication program are required to complete a core curriculum as follows: Speech-Communication 111, 232, 233, 234, and 353; Psychology 110; Sociology 101; Sociology 205 or Psychology 220; Anthropology 152; and Philosophy 100. The foreign language requirement listed earlier in the catalog must be satisfied. Additional requirements for the special programs in Speech-Communication are listed in the following sections.

FOUNDATIONS OF COMMUNICATION

This program is directed to the study of signs, symbols, and signals as they function in a context of human interaction. Theory and data derived from a wide variety of scientific fields are integrated to form the basis of study in human communication. Students interested in communication theory and language development are required to supplement the core curriculum with the following program: Speech-Communication 110, 330, 9 credits from the Foundations curriculum, and 15 credits in courses approved by the department chairmen.

This program is designed to contribute to the student's general education and to prepare him for graduate study in the field of communication theory and research. The undergraduate program is not intended to prepare a student for employment in the communication field. Appropriate graduate study qualifies the student for employment in education, business, industrial and governmental teaching, research, and other professional programs.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

119 PHONETICS 2. Transcription (International Phonetic Alphabet) and standards of pronunciation and dialect.

232-233-234 INTRODUCTION TO COMMUNICATION 5 (4-2)-232-233, (5-0)-234. Major concepts and principles, focusing on the physiological, psychological, sociological, and cultural determinants of the production and reception of signs in human communication. (232 Phonology: the production of language. (233) Audiology: the reception and perception of language and other acoustic stimuli. (234) Process: the nature and use of signs and symbols in the total process of communication, with particular reference to meaning.

301 HISTORICAL DEVELOPMENT OF THE FIELD OF COMMUNICATION 3. The major lines of influence leading to present theories, concepts and methods in the field of oral communication.

351 DEVELOPMENTAL SEMIOLOGY 3 prereq 234 and Psych 230. Characteristics and determinants of the sign process associated with the main stages in human development through the life span.

353 GENERAL SEMANTICS 3. The influence of language and language habits on perception, evaluation and decision; particular attention to the concepts of structure and meaning.

FOR UNDERGRADUATES AND GRADUATES

451 PSYCHOLINGUISTICS 3 a/y prereq 234 and Gen 360. Recent theories and evidence concerned with the empirical analysis of linguistic behavior.

471 COMPARATIVE SEMIOLOGY 3 a/y prereq Zool 111-112-113. The sign process based on evidence and observation at selected levels of the phyletic scale.

490 PROBLEMS V R-6 prereq 25 credits in Speech-Communication and c/i

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 recent behavioral theories and research data in the field of communication; emphasis is placed on the role of theory in the study of speech communication.

513 PSYCHOACOUSTICS 3 a/y prereq c/i. A critical evaluation of current research relating to the basic physical variables of speech and hearing and to the processes of speech analysis and synthesis.

515 SEMINAR: LABORATORY AND CLINICAL INSTRUMENTATION 3 prereq c/i.

519 SEMINAR: FOUNDATIONS OF MEASUREMENT 3 prereq Psych 220 or Soc 205 or =.

521 THEORIES OF INFORMATION 3 a/y prereq c/i. Current theory and research dealing with the process by which information is transmitted. Examination of source, message, channel and receiver variables.

541 PERSUASION 3 prereq c/i. An examination of theories and research concerned with the processes by which behavioral and attitudinal change are produced primarily by communication.

597. RESEARCH METHODS AND MATERIALS 5 prereq Soc 205 or Psych 220 or =. 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.

SYSTEMS OF COMMUNICATION

(Speech Communication)

Few processes are more fundamental to an understanding of the dynamic patterns of human existence and social organizations than the systems by which men communicate. Students who are interested primarily in systems of communication as critical factors in human relationships are required to supplement the core curriculum with the following courses: Speech-Communication 112, 314, 330, 355, 444, 445 or 446; and 11 approved electives in Speech-Communication. Students planning to teach in a speech program at the high school level are referred to the requirements listed under Education.

Study in this area provides an historical background, together with a knowledge of rhetorical and communication principles and practical experience which contributes to competence in professional speech and teaching in secondary schools, preparation for professional study at the graduate level, and for employment in business and industry in communication-oriented occupations. An emphasis in Systems of Communication at the graduate level leads to a Master of Arts degree with specializations in speech education, public address and rhetoric, or interpersonal and organizational communication.

GRADUATE WORK. See Graduate School.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

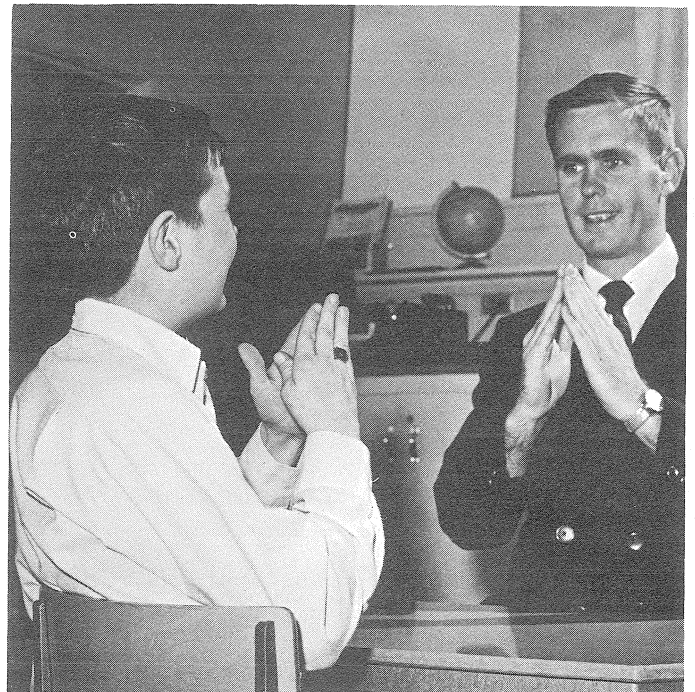
110 INTRODUCTION TO SYSTEMS OF COMMUNICATION 3. Theory and evidence relevant to interpersonal and intrapersonal systems of communication. The role of language in human interaction.

111 INTRODUCTION TO PUBLIC SPEAKING 3. The theories and principles of public speaking. Practice speech composition, delivery and criticism.

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. Principles and practice of attitude and behavior modification primarily by oral communication.

118 PRACTICUM IN ORAL EXPRESSION 3 (2-3). Principles of vocal expression, articulation and diction, with practical application through recording and evaluation.



223 (123) PUBLIC SPEAKING PRACTICUM 2 (0-4) prereq 111. Practice in speech composition, delivery and criticism beyond that introduced in Speech-Communication 111.

265 FORENSICS 1 R-6. Preparation of debates, orations, extemporaneous and impromptu speeches, and other types of public address.

313 (113) PARLIAMENTARY PROCEDURES 2. Theory and practice relating to the rules of parliamentary procedures.

314 (214) DISCUSSION AND SMALL GROUPS 3. Study and practice in the processes involved in informal small-group interaction. Includes theory and evidence related to concepts of leadership, communication patterns, group cohesion and social pressure.

316 COMMUNICATION IN ORGANIZATIONS 4. Emphasis on intra-organizational problems. Consideration of theory and research on questions of informational and directive communication as related to such factors as channels, structures, status, involvement, morale, etc.

355 SPEECH COMPOSITION 3 prereq 111. Factors related to materials, organization and support in the development of the speech.

356 SPEECH CRITICISM 2 prereq 355. The bases upon which the various forms of public speaking are evaluated.

361 (261) PERFORMANCE OF LITERATURE 3 (2-3) prereq 118. The analysis and oral presentation of literature.

371 SOCIODRAMA 3. Principles and practice of role-playing as a technique of communication; the development of the spontaneous-creative and the extemporaneous types of sociodrama.

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.

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. Principles and practice in public speaking beyond that considered at the beginning levels; emphasis on informative and persuasive speaking.

444 (344) HISTORY OF RHETORICAL THEORY 3 prereq 15 credits in Speech-Communication. Rhetorical theory from Corax to the present.

445 HISTORY OF AMERICAN PUBLIC ADDRESS 3 prereq 356 or c/i. Biographies and critical analyses of speeches of historically prominent American speakers and issues with which they were identified.

446 HISTORY OF BRITISH AND EUROPEAN PUBLIC ADDRESS 3 prereq 356 or c/i. Biographies and critical analysis of speeches of historically prominent British and European speakers and the issues with which they were identified.

462 DIRECTING THE FORENSIC PROGRAM 3. Philosophy, organization, and administration of competitive speech activities. Prereq Speech 422 or c/i.

469 (369) THE INTERPRETIVE ARTS 3 prereq 361 or c/i. The theories and relationships of the interpretative arts.

490 PROBLEMS V R-6 prereq c/i.

FOR GRADUATES

512 SEMINAR: ORGANIZATIONAL COMMUNICATION 3 a/y prereq 316 or c/i.

514 SEMINAR: SMALL GROUP COMMUNICATION 3 a/y prereq 314 or c/i.

545 SEMINAR: SPEECH CRITICISM 3 a/y prereq 356 or c/i.

551 CONTEMPORARY PUBLIC ADDRESS 3 a/y prereq 444 or 445 or c/i.

553 SEMINAR: HISTORY OF RHETORIC AND PUBLIC ADDRESS 3 a/y prereq 444 or 445 or c/i.

571 SEMINAR: SOCIODRAMA 3 a/y prereq 371.

599 TOPICAL SEMINAR V R-9 prereq c/i.

600 RESEARCH V R-10 prereq c/i.

699 THESIS V R-12.

DISORDERS OF COMMUNICATION

(Speech Pathology and Audiology)

Individuals with speech and hearing disorders constitute our largest group of exceptional persons. Students interested in these problems, their causes and remedial procedures should supplement the core curriculum with the following courses: Speech-Communication 110, 119, 335, 336, 338, 340, 341, 342, 351 and 471; Psychology 230 and 420; and Zoology 202.

Although students take the Bachelor of Arts degree in Speech-Communication, with an emphasis in Disorders of Communication, this is a pre-professional degree and is not intended to prepare a student for employment in the field of Speech Pathology and Audiology. With appropriate graduate preparation, the student can meet the requirements for the Master of Arts degree in Speech Pathology and Audiology and qualify for a Certificate of Clinical Competence which is issued by the American Speech and Hearing Association. Persons thus certified are employed in a variety of settings, such as: clinical service centers, hospitals, public schools, health departments, colleges and universities, industrial programs, research centers and private practice.

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

330 INTRODUCTION TO SPEECH PATHOLOGY 3. For non-majors. A survey of speech and language problems commonly encountered in the classroom. (Non-majors may take for graduate credit.)

335 COMMUNICATION DISORDERS I 5 prereq 119, 232, 233, and 234. An introduction to communication disorders as an educational and clinical field. Theories, research and selected remedial procedures relating to disorders of articulation, voice and language reception.

336 COMMUNICATION DISORDERS II 5 prereq 335. Theories, research and selected remedial procedures relating to disorders of language production, rhythm and fluency.

337 COMMUNICATION DISORDERS III 3. Theories, research and selected remedial procedures relating to logical, semantic and process disorders.

338 (337) CLINICAL PROCEDURES FOR COMMUNICATION DISORDERS 3 prereq 336 or c/i. Principles and methods of habilitation and rehabilitation for children and adults with communication disorders.

341 (331) DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS I 3 prereq or coreq 335. Clinical experiences with tools and techniques needed to assess and diagnose speech and hearing problems of the adult and child.

342 (332) DIAGNOSIS AND APPRAISAL OF COMMUNICATION DISORDERS II 2 prereq 341. Supervised clinical practice in the out-patient clinic.

380 (340) CLINICAL AUDIOLOGY 3 prereq 233. Fundamental principles related to the measurement of hearing. Psychosocial problems and clinical techniques employed with the acoustically handicapped.

FOR UNDERGRADUATES AND GRADUATES

423 (333) CLINICAL PRACTICUM 1-3 R-4 prereq 338 and 341. Thirty clock hours per credit of supervised clinical practice in the Speech and Hearing Clinic.

431 (531) STUTTERING 3 prereq 336. Stuttering as learned behavior; emphasis on prevention and habilitation.

432 (532) ORGANIC DISORDERS OF COMMUNICATION I 3 prereq 336 and 341. Theories, research and therapeutic procedures for problems of communication associated with anomalies in anatomical structure.

433 (533) ORGANIC DISORDERS OF COMMUNICATION II 3 prereq 336 and 341. Theories, research and therapeutic procedures for problems of communication associated with neurological disorders.

435 METHODS OF SPEECH AND HEARING THERAPY IN THE SCHOOL 2 prereq 338. Methods and policies related to establishing and conducting a speech and hearing program in a school system with emphasis at the elementary level.

481 DIAGNOSTIC AUDIOLOGY 3, prereq 380. Special audiometric procedures used in otological diagnosis, pediatric audiology, hearing conservation in schools, professional issues in audiology.

482 REHABILITATION OF THE HEARING HANDICAPPED 3 prereq 380. Speech reading, auditory training, hearing aid fitting and evaluation, speech habilitation and conservation in children and adults; relationships with education and vocational counselling.

490 PROBLEMS V R-6 prereq c/i.

FOR GRADUATES

523 (433) ADVANCED CLINICAL PRACTICUM IN COMMUNICATION DISORDERS V R-6 prereq 4 credits of 423.

536 (436) PRACTICUM IN SCHOOL SPEECH AND HEARING THERAPY V R-9 prereq 435.

537 SEMINAR: STUTTERING RESEARCH AND THEORIES 3 prereq c/i.

538 SEMINAR: ANATOMICAL DEFECTS OF SPEECH 3 prereq c/i.

539 SEMINAR: NEUROMUSCULAR DEFECTS OF SPEECH 3 prereq c/i.

547 SEMINAR: LANGUAGE DISORDERS 3 prereq c/i.

583 ADVANCED CLINICAL AUDIOLOGY 3 prereq 481. Noise measurement exposure and control; hearing conservation in industry architectural acoustics survey; experimental clinical procedures, administrative aspects of audiological services.

584 INSTRUMENTATION FOR AUDITORY REHABILITATION 3 prereq 482. 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.

585 (540) SEMINAR: MEASUREMENT OF HEARING 3 prereq c/i.

586 (542) SEMINAR: REHABILITATION OF THE ACOUSTICALLY HANDICAPPED 3 prereq c/i.

587 (544) SEMINAR: HEARING CONSERVATION PROGRAMS 3 prereq c/i.

599 TOPICAL SEMINAR V R-9 prereq c/i.

600 RESEARCH V R-10 prereq c/i.

699 THESIS V R-12.

Terrestrial Option

Junior Year

Zoology 309, 308—Mammalogy, Ornithology	5		5
Zoology 340, 341—Mammalian Physiology	5	5	
Botany 366, Agrostology		5	
Forestry 360—General Range Management	4		
English 350—Advanced Composition			3
Botany 355—Plant Ecology			5
Group requirements and electives	3-4	6-8	3-5
	17-18	16-18	16-18

Senior Year

	A Cr.	W Cr.	S Cr.
Forestry 470, 471, 472—Advanced Wildlife Management, Big Game Management, Habitat Management	5	3	5
Forestry 460, 352—Range Techniques, Aerial Photogrammetry	4	3	
Zoology 410—Advanced Animal Ecology			5
Zoology 405—Animal Behavior		5	
Group requirements and electives	5-8	3-5	5-8
Group requirements and Zoology—Botany—Forestry 491, 492, 493—Senior Wildlife Seminar	1	1	1
	15-18	15-17	16-19

Suggested electives: Any courses in Aquatic Option not required in Terrestrial Option, any courses from list of appropriate additional courses shown below.

Aquatic Option

Junior Year

Zoology 310, 206—Ichthyology, Field Zoology	5		3
Zoology 340, 341—Mammalian Physiology	5	5	
Zoology 365—Entomology			5
Botany 355—Plant Ecology			5
English 350—Advanced Composition		3	
Group requirements and electives	5-8	7-9	3-6
	15-18	15-17	16-19

Senior Year

Zoology 307, 413, 428—Aquatic Biology, Fisheries Science, Invertebrate Ecology	5	3	5
Forestry 450—Hydrology		2	
Botany 441—Phycology	5		
Zoology 405—Animal Behavior		5	
Group requirements or electives	5-8	5-7	10-12
Zoology—Botany—Forestry 491, 492, 493—Senior Wildlife Seminar	1	1	1
	16-19	16-18	16-18

One summer at the University of Montana Biological Station (or other Biological Station) enrolled in Zoology 461, Limnology, and one of the following three courses: Zoology 366, Aquatic Insects, Zoology 433, Problems in Vertebrate Ecology, or Botany 368, Aquatic Flowering Plants. This summer could be taken either after the junior year or the senior year. Suggested electives: Any courses in Terrestrial Option not required in the Aquatic Option, any course from list of appropriate additional courses shown below:

Wildlife Science Option

Junior Year

	A Cr.	W Cr.	S Cr.
Zoology 485—Genetics	5		
English 350—Advanced Composition		3	
Foreign Language 101, 102, 103—French, German or Russian	5	5	5
Math 125, 151—Statistics, Analytical Geometry and Calculus		5	5
Advanced courses from selected list	4-5	7-8	7-8
	17-18	17-18	17-18

Senior Year

Foreign Language 211-212—French, German or Russian	4	4	
Advanced courses from selected list	10-12	10-14	14-15
Senior seminar	1	1	1
	15-17	15-17	15-16

An approved series of courses from either option to be worked out with adviser. Minimum courses for students interested in Aquatic Wildlife: Zoology 206, 307, 310, 413 and for the students interested in Terrestrial Wildlife: Zoology 308, 309, Forestry 470, 471, 472.

Appropriate additional courses for Wildlife students to select in any option aside from those shown above include: Chemistry 261, 262, Botany 333, 334, 335, 361, 370, 386, 465, Economics 201, 202, Forestry 311, 330, 361, 380, 385, 480, 481, 482, 484, Geography 370, Geology 110, 130, 200, 451, Microbiology 200, 302, Math 344, 345, Political Science 362, Speech 111, Zoology 303, 304, 404.

WILDLIFE BIOLOGY

is the study of wild vertebrate animals and their conservation. It is based on the natural sciences, with particular emphasis in the biological sciences. It constitutes a preparation for professional work in fish and game conservation.



Within the broad designation of Wildlife Biology, there are three optional curricula: Terrestrial Wildlife Biology, Aquatic Wildlife Biology, and Wildlife Science. As indicated below: each has the same schedule of courses for the first two years and a different curriculum for the last two years. Each leads to the Bachelor of Science in Wildlife Biology. Many graduates will continue their education through the Master's

degree. The Wildlife Science curriculum is designed particularly for students with strong academic records who intend ultimately to work toward a doctorate.

This university is particularly well suited for instruction in this area of learning because of the excellent opportunities for field instruction and research, and the presence of such facilities as the Biological Station, the Montana Forest and Conservation Experimental Station, and the Montana Cooperative Wildlife Research Unit.

HIGH SCHOOL PREPARATION. In addition to the general requirements for admission to the University the student should elect four years of mathematics in high school.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN WILDLIFE BIOLOGY. In addition to the general requirements for graduation listed earlier in the catalog the student must complete the requirements as listed for one of the three options indicated below. Note that a study of foreign language is required only in the Wildlife Science option.

CURRICULA IN WILDLIFE BIOLOGY

Freshman Year

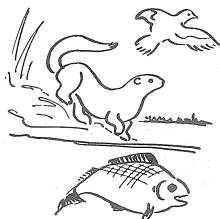
	A Cr.	W Cr.	S Cr.
Botany-Zoology 111—General Biology	5		
Botany 112, 113—General Botany		5	5
Chemistry 101, 102, 160—General, Survey, Organic or Chemistry 121, 122, 123—College Chemistry	4	4	5
English 150—Freshman Composition	5	5	5
Math 116, 117—College Algebra, Trigonometry	3		
Group Requirements	3-5	0-3	0-3
H&PE—Physical Education	1	1	1
	16-19	15-19	16-19

Sophomore Year

Zoology 112, 113—General Zoology		5	5
Botany 325, 265—Plant Physiology, Systematic Botany	5		4
Math 125—Statistics			5
English 250—Intermediate Composition		3	
Zoology 250—Principles of Animal Ecology	3		
Forestry 210—Elementary Soils	4		
Physics 111; 112 or 113—General Physics	5	0-5	0-5
Group requirements	0	3-8	0-5
H&PE—Physical Education	1	1	1
	18	17	15-20

ZOOLOGY

is the study of animals—how they are put together, how their bodies work, and how they adjust to their surroundings. It is a basic science for many professional fields such as medicine, pharmacy, wildlife, and physical education.



In addition to the Bachelor's degree, the Master of Arts (or Master of Science) and the Doctor of Philosophy degrees are offered.

Undergraduate courses involve much laboratory work as well as opportunities for field work. During the summer extensive field experience is available at the Biological Station maintained on Flathead Lake for qualified upperclass and graduate students.

Graduates become high school teachers or, after advanced studies, instructors in colleges and universities. Others enter state or federal government service in health and conservation agencies. Many, with further training, enter medicine or related fields. A few establish themselves as fish culturists, fur farmers, pest control experts, and so on.

SPECIAL REQUIREMENTS FOR THE UNDERGRADUATE DEGREE IN ZOOLOGY. In addition to the general requirements for graduation listed earlier in the catalog, the following special requirements must be completed for the Bachelor of Arts degree with a major in Zoology: Zool 111, 112, 113, 429, and at least one course from each of the following 6 groups: (1) Morphology, 304, 305, 313, 404; (2) Invertebrate Zoology, 206, 321, 322, 323, 324, 364, 365, 366; (3) Vertebrate Zoology, 306, 308, 309, 310; (4) Physiology, 330, 340, 341; (5) Ecology, 250, 307, 410, 428, 461; (6) Genetics, 485.

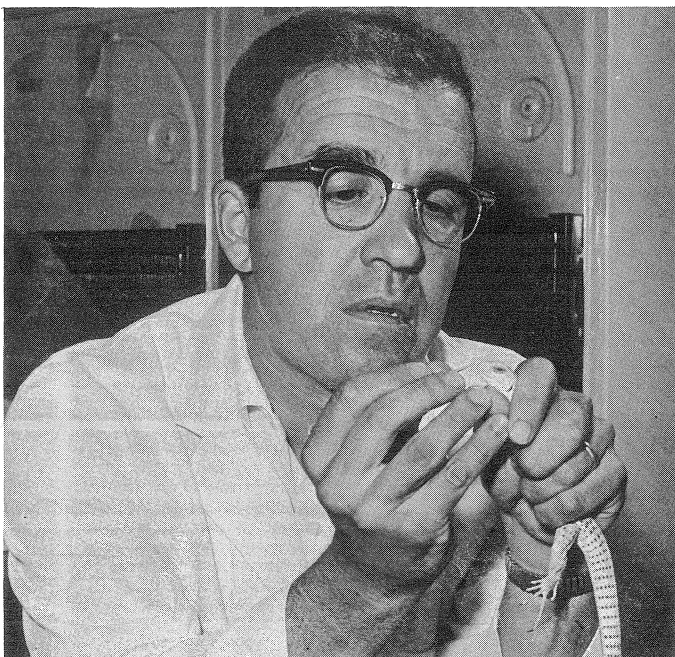
Students may substitute Chem 261, 262 for either group 3 or 4. The following must also be completed: Botany 112, 113; Chemistry 121-122-123; Mathematics 116, 117, 118; Physics 111-112-113 or 121-122-123.

The foreign language requirement listed earlier in the catalog must be satisfied. Normally Zoology majors take 5 quarters of French, German or Russian. Other languages or combinations must be approved by the department.

The Pre-medical Sciences student may earn a degree in Zoology by completing requirements in that curriculum and presenting a total of 35 credits in Zoology or related fields as follows: Zool 111, 112, 113, 404, 485; any one course from Zool 206, 308, 309, 310, 321, 364, 365, 366, 428, 461; any one course from Microbiology or from Botany or one course from Zool 304, 305, 313, 322, 323, 324, 340, 341.

Senior examinations are given only to candidates for honors.

GRADUATE WORK. See Graduate School.



SUGGESTED CURRICULUM IN ZOOLOGY

Freshman Year

	A Cr.	W Cr.	S Cr.
English 150—Freshman Composition	3		
Math 116, 117, 118—College Algebra, Trig, and Introduction to Calculus	5	5	5
Zoology 111, 112, 113—Introduction to Biology, General Readings	5	5	5
Group requirements	4	4-6	6
H&PE 100—Physical Education	1	1	1
	18	15-17	17

Sophomore Year

Chem 121-122-123—College Chemistry	5	5	5
English 250—Intermediate Composition		3	
Foreign Language 101-102-103—Elementary French, German, or Russian	5	5	5
Group requirements	5-7	2-4	5-7
H&PE 100 Physical Education	1	1	1
	16-18	16-18	16-18

Junior Year

English 350—Advanced Composition			3
Foreign Language 211-212—French, German, or Russian Readings	4	4	
Physics 111-112-113 or 221-222-223—General Physics	5	5	5
Zoology Advanced Courses	5	5	5
Group requirements	0-3	0-3	2-4
	14-17	14-17	15-17

Senior Year

Botany 112, 113—General Botany		5	5
Zoology 429—Biological Literature		1	
Zoology Advanced Courses or Chem 261, 262	5	5	5
Electives	9-10	5-6	7-8
	14-15	16-17	17-18

FOR UNDERGRADUATES

For Explanation see Course Descriptions (Index)

Courses also offered at Biological Station (*Courses only at Biological Station): 308, 309, *364, 365, *366, 431, 433, 434, 436, *461, *521, *551, *561, 600, 699.

111 INTRODUCTION TO BIOLOGY 5 (3-4). Introduction to the 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.)

202 HUMAN PHYSIOLOGY 5 (3-4) prereq sophomore standing with at least one science course or two quarters of college zoology. The normal physiology of blood circulation, respiration, digestion, excretion, irritability, locomotion, coordination, and reproduction.

206 FIELD ZOOLOGY 3 (2-5) prereq 113. Collection, identification and preservation of animals. Field work.

250 (350) BASIC CONCEPTS OF ECOLOGY 3 (3-0) prereq one year of college biology. Introduction to ecological principles with emphasis on the ecosystem. (Credit not allowed for this course and Bot 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 Bot 251.)

FOR UNDERGRADUATES AND GRADUATES

301 GENERAL COMPARATIVE EMBRYOLOGY 5 (3-4) a/y prereq 311-312. The early stages of development of the invertebrates and vertebrates, including meiosis, fertilization, cleavage, formation of the germ layers and early organogenesis.

304 COMPARATIVE VERTEBRATE ANATOMY 5 (3-4) prereq 113. The comparative morphology of the vertebrates.

305 ANIMAL MICROTÉCHNIQUE 5 (2-6) prereq 113. Preparation of smears and squashes, clearing and staining whole mounts, paraffin sectioning, frozen sections with clinical microtome and cryostat microtome, polyester embedding and histochemical methods. A brief introduction to tissue types will be given at the start of the course. May be taken concurrently with 313.

306 HERPETOLOGY 3 (2-2) o/y prereq 113. The taxonomy, distribution, and life histories of amphibians and reptiles.

307 AQUATIC BIOLOGY 5 (3-7) prereq 206 or 365 and Bot 265. The biota of fresh water with emphasis upon the flora and invertebrate fauna, with some consideration of their relationship to the food chains and habitats of aquatic vertebrates. Ecology, identification and taxonomic position of aquatic organisms below vertebrates.

308 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.

309 MAMMALOLOGY 5 (3-4), Su 6 at Biological Station, prereq 113. The classification, identification and life histories of mammals. Saturday field trips.

310 ICHTHYOLOGY 5 (3-4) prereq 113. The systematics 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.

313 (305) VERTEBRATE HISTOLOGY 5 (3-4) prereq 113. Basic animal cytology, tissue types and organology are studied. May be taken concurrently with 305.

321 PROTOZOOLOGY 5 (3-4) prereq 113. Taxonomy, structure, natural history, physiology, and ecology of protozoans.

322 LOWER METAZOANS 5 (3-4) prereq 113. Structural ecological and phylogenetic relationships among sponges, coelenterates, acelomates and nematodes.

323 MIDDLE METAZOANS 5 (3-4) prereq 113. Structural, ecological and phylogenetic relationships among the mollusks and annelids and certain smaller invertebrate phyla.

324 ARTHROPODS 5 (3-4) prereq 113. Structural, ecological and phylogenetic relationships among the arthropods exclusive of insects.

330 CELLULAR PHYSIOLOGY 5 (3-4) o/y prereq two courses in Physics, Chem 262 or 160, one course in Botany, Microbiology or Zoology. The life processes at the cellular level emphasizing the methods of the physical sciences. Jointly listed as Botany 330.

331 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. (340) General physiological properties of protoplasm; blood, body fluids, and circulation; respiration and excretion. (341) Digestion, nutrition and intermediary metabolism; excitation, conduction, responses, senses; endocrines and reproduction.

364 INVERTEBRATES OF THE INTERMOUNTAIN REGION 3 (5-12) prereq 113. The ecology, taxonomy and distribution of the invertebrates of the Rocky Mountain area, exclusive of parasites and insects.

365 ENTOMOLOGY 5 (3-4) Su 6 at Biological Station, prereq 113. The structure, classification, life histories, distribution and ecology of insects.

366 AQUATIC INSECTS 3 (3-12) prereq 113. The insect fauna, both immature and adult, in aquatic habitats of Western Montana.

403 BIOLOGICAL ILLUSTRATIONS 2 (0-4) prereq 1 year of biology and c/i. Introduction to the basic principles and skills of producing illustrative materials relevant to the biological sciences. (\$25 special supplies fee. Credit not allowed for this course and Bot 403.)

404 (302) VERTEBRATE EMBRYOLOGY 5 (3-4) prereq 304. The early stages of development of the vertebrates including organogenesis, with emphasis on birds (chick) and mammals (pig).

405 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.

410 (510) ADVANCED ANIMAL ECOLOGY 5 (2-8) prereq Math 125, and 4 courses in Zoology, including 250. The influence of physical and biotic factors on population structure, density, and productivity and on community organization. Theoretical as well as practical aspects are considered. Weekend field trips.

413 FISHERY SCIENCE 3 (3-6) prereq 307, 310. The problems involved in investigations on fisheries biology with an analysis of, and some actual field experience in, methods employed in attacking these problems. Field trips.

428 (328) INVERTEBRATE ECOLOGY 5 (2-8) e/y prereq 206, Bot 265 or =. Zool 307 or 311, 312 recommended. The relationships between animals and their environment with special emphasis on the invertebrates. Saturday field trips.

429 BIOLOGICAL LITERATURE 1 (2-0) prereq 20 credits in botany or zoology. Student reports of literature of the trend of investigation and experimentation in biological fields.

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.

442 BIOLOGY OF FOREST INSECTS 3 (2-3) prereq 113, 365. Insect biology, ecology, physiology, and genetics as they relate to forest insects and forest insect problems; the ecological position of insects in the forest ecosystem; introduction to population dynamics. Jointly listed as Forestry 432.

443 FOREST INSECT ECOLOGY 3 (2-3) prereq 442 or For 432. Factors which regulate the distribution and abundance of insects; characteristics of outbreaks; the biometeorological and behavioral components of insect population changes; the rational basis of control. Jointly listed as Forestry 433.

450 MARINE INVERTEBRATES 3 (1-2) prereq 436, a problem in marine biology. The systematics and ecology of marine invertebrates with particular reference to habitat niche of the animals of the Pacific Coast. (A 3-day trip to coast of Oregon or Washington required.)

461 LIMNOLOGY 6 (5-25) prereq 113 and Chem 123. Ecology of lakes, streams and ponds, with emphasis on the physical, chemical and biotic factors which determine their biological productivity.

485 (385) 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.)

490 SEMINAR IN BIOLOGY 1 (2-0). Special problems in Biology. Credit not allowed for this course and Bot 490.

491-492-493 SENIOR WILDLIFE SEMINAR 1 prereq senior standing in Wildlife Biology or Forestry. Reports and discussion by students, faculty, and guests speakers on current topics in Wildlife Biology. (Double-listed as Forestry 491-492-493.)

FOR GRADUATES

500 SEMINAR 1 prereq graduate standing in a biological science.

501 AREAS AND CONCEPTS OF ZOOLOGY 1 prereq graduate standing in Zoology or in Wildlife Biology. An orientation course for all new graduate students in zoology.

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

503 EXPERIMENTAL EMBRYOLOGY 5 (1-8) prereq Zool 404 and c/i. Basic concepts of embryology elucidated by means of experimentation of amphibian, chick, or other vertebrate embryos. Report preparation.

504 ADVANCED ANIMAL BEHAVIOR 5 (2-6) prereq 405 or c/i. The causation and function of normal behavior with emphasis on the experimental approach to the study of behavior. Ecological aspects of behavior.

505 ACAROLGY 5 (3-4) o/y prereq 324 or 365 or c/i. Comparative adaptive morphology, bionomics and current taxonomic concepts.

515 ZOOGEOGRAPHY 4 (3-1) prereq 2 courses in advanced vertebrate zoology. Past and present distribution of animals, with special emphasis on vertebrates. Influence of climate, place of origin, dispersal routes, and faunal composition. Geological and botanical evidences considered.

516 CONCEPTS AND PRINCIPLES OF SYSTEMATIC ZOOLOGY 3 (3-0) o/y prereq 25 hours in zoology including 250 and 485. Selected topics relating to evolution, speciation and the various philosophies influencing systematic zoology.

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

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

531 (402) COMPARATIVE PHYSIOLOGY-INVERTEBRATE 5 (3-4) prereq Physics 113 or 223, Chem 262 and one animal physiology course. Physiological process of the organ systems of the major invertebrate phyla in relation to environment.

532 (402) COMPARATIVE PHYSIOLOGY-VERTEBRATE 5 (3-4) prereq Physics 113 or 223, Chem 262 and one animal physiology course. Physiological processes of the organ systems of the five vertebrate classes in relation to environment.

533 (333) ENDOCRINOLOGY 5 (3-4) prereq Zool 113 and one animal physiology course. The physiology of the glands of internal secretion of the vertebrates with a survey of those of the invertebrates.

551 GENERAL ECOLOGY Su 5 (6-15) prereq Bachelor's degree; major preparation in Botany, Biology or Zoology. Community concepts including succession, stratification, periodicity and energy relationships; introduction to population problems.

561 LIMNOLOGICAL METHODS 3 (3-12) prereq 461, Chem 123. Practice in standard procedures employed. Field work.

600 ADVANCED ZOOLOGICAL PROBLEMS V 1-5. Students with sufficient preparation and ability pursue original investigations.

699 THESIS V R-15.

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Italian	44	Government Research, Bureau of	10	Transfer Students, Admission of	11
Journalism	58	Grade Point Requirements (Quality of Work)	13		
Latin	44	On Transfer Credits	13	Unclassified Students	11
Law	59	Grade Points	13	University of Montana	1, 9
Liberal Arts	61	Grading System	13	Use of Catalog	1
Library Service	61	Graduate School	15, 20		
Linguistics	61	Graduation, Catalog Governing	14	Veteran Registration (P.L. 634 or 815)	16
Mathematics	62	Graduation, Requirements for	13		
Medical Technology	63	Graduation, With Honors or High Honors	15	Waiver of Prerequisite	12
Microbiology	64	Grants, Educational Opportunity	18	War Service Fee Exemptions	16
Military Science	78	Group Requirements	13	Wildlife Research Unit	10
Music	65	Health Service, Student	17	Withdrawal from a course (changes in program)	12
Pharmacy	69	Honors, Senior Examination for	15	Withdrawal of a Course	12
Philosophy	70	Housing, Family	17	Withdrawals from the University	12
Physical Education (Health and P.E.)	52	Housing, Student	17	Women's Cooperative House	18
Physical Therapy	71	Incomplete Grades, Fee for Removal	16	Work-Study Program	18
Physics	72	Incomplete Grades, Removal of	13		
Political Science	73	Independent Work	12		
Pre-Medical Sciences	74	Instruction, Organization of	20		
Pre-Nursing	75	Leaves of Absence	20		
Psychology	75				
Radio-Television	77				
Religion	77				
ROTC	78				
Romance Philology	44				
Russian	44				



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