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1909-1910 Course Catalog

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UNIVERSITY OF MONTANA
BULLETIN NO. 64. REGISTER SERIES NO. 15
MAY, 1910

THE UNIVERSITY OF MONTANA

REGISTER, 1909-10

Entered August 24, 1901, at Missoula, Montana, as second class matter, under act of Congress, July 16, 1894.

PUBLICATIONS OF THE UNIVERSITY

The publications of the University are issued in a general series of Bulletins, which include the register, reports of the president, monographs of scientific and literary character by the different departments of the university, and miscellaneous circulars on special courses, summer school sessions, biological station work, interscholastic meet, high school debating league, and other announcements of a general character.

Registers, reports and circulars are sent gratuitously to anyone wishing them. Address requests to the President's Office, University of Montana, Missoula, Montana.

For information regarding scientific and literary bulletins, see the inner page of the back cover of this Register.

THE FIFTEENTH REGISTER

OF THE

University of Montana

MISSOULA, MONTANA

1909-10

With Certain Announcements for 1910-11

MISSOULIAN PUBLISHING COMPANY

19 SEPTEMBER 10						
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT
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1911	AUGUST					1911
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UNIVERSITY CALENDAR

1910-1911

FIRST SEMESTER

Entrance examinations, Monday, September 12.

Registration day, Tuesday, September 13.

Instruction begins 8:30 a. m., Wednesday, September 14.

Columbus day, a holiday, Wednesday, October 12.

Thanksgiving recess, 12:30 p. m., Wednesday, November 23, to 8:30 a. m., Monday, November 28.

Christmas holidays, 4:00 p. m., Friday, December 16, to 8:30 a. m., Tuesday, January 3.

First semester ends, 4:00 p. m., Friday, January 27.

SECOND SEMESTER

Entrance examinations, Monday, January 30.

Registration day, Tuesday, January 31.

Instruction begins 8:30 a. m., Wednesday, February 1.

Lincoln's birthday, a holiday, Sunday, February 12.

Charter day, Friday, February 17.

Washington's birthday, a holiday, Wednesday, February 22.

Buckley oratorical contest, Friday, April 14.

Arbor day, a holiday, Tuesday, May 9.

Final debate, High School League, 8:00 p. m., Tuesday, May 9.

Interscholastic meet, Wednesday, Thursday, Friday, May 10, 11, 12.

Memorial day, a holiday, Tuesday, May 30.

Instruction ends 4:00 p. m., Friday, June 2.

Baccalaureate day, Sunday, June 4.

Annual music recital, 8:30 p. m., Monday, June 5.

Annual address before literary societies, 8:00 p. m., Tuesday, June 6.

Class day exercises, 10:30 a. m., Wednesday, June 7.

Alumni annual dinner, 7:00 p. m., Wednesday, June 7.

Commencement exercises, 10:30 a. m., Thursday, June 8.

University luncheon, 1:00 p. m., Thursday, June 8.

President's reception, 8:30 p. m., Thursday, June 8.

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MONTANA STATE BOARD OF EDUCATION

EX-OFFICIO

GOVERNOR EDWIN L. NORRIS, President.
ALBERT J. GALEN, Attorney General.
W. E. HARMON, Supt. Pub. Instruction, Secretary.

APPOINTED

JOHN M. EVANS, Missoula	Term Expires February 1, 1910
CHARLES R. LEONARD, Butte	" " " 1, 1910
O. W. McCONNELL, Helena	" " " 1, 1911
ROY AYRES, Lewistown	" " " 1, 1911
O. P. CHISHOLM, Bozeman	" " " 1, 1912
S. D. LARGENT, Great Falls	" " " 1, 1912
G. T. PAUL, Dillon	" " " 1, 1913
H. G. PICKETT, Helena	" " " 1, 1913

B. T. HATHAWAY . . . . . Clerk of the Board

EXECUTIVE BOARD OF THE UNIVERSITY

C. A. DUNIWAY	Chairman (ex-officio)
A. L. DUNCAN	Term Expires April 19, 1911
J. H. T. RYMAN, Treasurer	" " " 19, 1913
J. B. SPEER	Secretary

THE FACULTY

CLYDE AUGUSTUS DUNIWAY, Ph. D. . . Maurice and Beckwith

President.

A. B., Cornell University, 1892; A. M., Harvard University, 1894; Ph. D., Harvard University, 1897; Instructor in History, Harvard University and Radcliffe College, 1896-97; Assistant Professor of History, Leland Stanford Jr. University, 1897-99; Associate Professor of History, Stanford University, 1899-1908; Associate Professor of History, University of California, Summer School, 1900; Student in Leipzig, Berlin, and Paris, 1901-02; Professor of History, Stanford University, 1908; President, University of Montana, since September 1, 1908.

W. M. ABER, A. B. . . . . 402 Eddy St.

Professor of Latin and Greek

Graduate from Normal School at Oswego, N. Y., 1872, and from Yale in 1878; Graduate Student at Johns Hopkins, Cornell and University of Chicago; Instructor in Oswego Normal School; Professor of Latin and Greek, University of Utah, 1890-94; Professor of Latin and Greek, University of Montana, since 1895.

FREDERICK C. SCHEUCH, B. M. E., A. C. . 309 S. 5th St. West

Professor of Modern Languages.

Attended Public Schools, Barcelona, Spain; Graduate, Gymnasium, Frankfurt on the Main, Germany; B. M. E., Purdue University, 1893; A. C., same, 1894; Secretary of the Faculty, University of Montana, 1895-1909; Professor of Modern Languages, since 1895.

MORTON JOHN ELROD, Ph. D. . . . . 205 S. 5th St. East

Professor of Biology.

B. A., Simpson, 1887; M. A., Simpson, 1890; M. S., Simpson, 1898; Ph. D., Illinois Wesleyan University, 1905; Adjunct Professor of Science, Illinois Wesleyan University, 1888-89; Professor of Biology and Physics, Illinois Wesleyan University 1889-97; Director, University of Montana Biological Station, since 1899; Professor of Biology, University of Montana, since 1897.

FRANCES CORBIN, B. L. . . . . Sixth and Chestnut Sts.

Professor of Literature.

Chicago Woman's College, 1885-87; New York State Normal School, Graduated, 1888; Student in Vassar College, 1890-93; B. L., Ohio College, 1902; Student in Harvard Summer School, 1904; Teacher of Literature, and Principal, Butte High School, 1893-1900; Professor of Literature, University of Montana, since 1900.

WILLIAM D. HARKINS, Ph. D. . . . . 521 E. Pine St.

Professor of Chemistry.

A. B., Stanford University, 1900; Ph. D., 1907; Graduate Student, University of Chicago, 1901 and 1904; Graduate Student, Stanford University, 1905-06; Assistant in Chemistry, Stanford University, 1898-1900; Instructor in Analytical Chemistry, Stanford University, 1900; Instructor in Chemistry and Physics, University of Montana, 1900-01; Institut fur Physikalische Chemie u. Elektrochemie, Karlsruhe, i. B., 1909; Research Associate, Research Laboratory of Physical Chemistry, Massachusetts Institute of Technology, 1910; Professor of Chemistry, University of Montana, since 1901. (Absent on leave, 1909-10).

JESSE PERRY ROWE, Ph. D. . . . . 319 University Avenue

Professor of Physics and Geology.

B. S., University of Nebraska, 1897; M. A., 1903; Ph. D., 1906; Student, University of Oregon, 1893; Graduate Student, University of California, summer, 1901; Graduate Student, Chicago University, summer, 1905; Assistant in Geology, University of Nebraska, 1894-97, Fellow and Instructor, 1897-98; Assistant Principal, High School, Butte, 1898-99; Principal Lincoln School, Butte, 1899-1900; Instructor in Physics and Geology, University of Montana, 1900-01; Director, University of Montana Geological Survey, since 1902; Assistant, United States Geological Survey, 1906; Professor of Physics and Geology, University of Montana, since 1901.

WILLIAM FREDERICK BOOK, Ph. D. . . . . 402 Eddy St.

Professor of Psychology and Education.

A. B., Indiana University, 1900; Ph. D., Clark University, 1906; Graduate Student, Chicago University, 1901; Fellow in Psychology, Clark University, 1903-06; Principal, High School, Princeton, Indiana, 1900-03; Lecturer in Psychology, Summer Quarter, Indiana University, 1907; Professor of Education, Summer Quarter, University of Indiana, 1910; Professor of Psychology and Education, University of Montana, since 1906.

JOSEPH HARDING UNDERWOOD, Ph. D. . 621 University Avenue

Professor of History and Economics.

B. A., Western College, 1902; M. A., State University of Iowa, 1904; Ph. D., Columbia University, 1907; Graduate Scholar in Economics, State University of Iowa, 1902-03; Fellow in Economics, State University of Iowa, 1903-04; University Fellow in Sociology, Columbia University, 1904-05; Student, University of Chicago, 1906; Instructor in English and History, Nora Springs (Iowa) Seminary, 1905-06; Professor of History and Political Science, Leander Clark College, 1906-07; Professor of History and Economics, University of Montana, since 1907.

LOUIS CLARK PLANT, M. S. . . . . 404 Eddy St.

Professor of Mathematics.

Ph. B., University of Michigan, 1897; Principal, Olive, Michigan, 1889-91; Overisel, Michigan, 1891-93; Graduate Student, University of Chicago, 1897-98, and Summers, 1899, 1900, 1902, 1905, 1906, 1907; M. S., University of Chicago, 1904; Assistant in Mathematics, Bradley Polytechnic Institute, 1898-1900; Associate, ibid., 1900-04; Instructor, ibid., 1904-07; Associate Professor of Mathematics, University of Montana, 1907-08, and Professor of Mathematics, since 1908.

MRS. BLANCHE WHITAKER . . . . . 322 S. 5th St. East.

Professor of Music.

Educated in England in Private Schools, taking by examination the Degree of Associate in Arts of the University of Oxford; musical training under Dr. Cedric Bucknall and Edward Roeckel; professional career beginning in 1888; Instructor in Music and Director of Music School, University of Montana, since 1896.

ARTHUR WILLIAM RICHTER, M. M. E. . 305 University Avenue

Professor of Engineering, In Charge of School of Engineering.

Graduate, University of Wisconsin and Cornell University; M. M. E., Cornell University and University of Wisconsin; Instructor in Engineering, Assistant Professor of Steam Engineering, Assistant Professor of Experimental Engineering ,and Professor of Experimental Engineering, University of Wisconsin, 1902-09; Professor of Engineering, University of Montana, since September 1, 1909.

ALVIN J. COX, Ph. D. . . . . 315 University Avenue

Acting Professor of Chemistry.

B. A., Stanford University, 1901, and M. A., 1902; Ph. D., University of Breslau, 1904; Assistant in Chemistry, 1898-1901, Instructor in Analytical Chemistry, 1901-02, and Instructor in Chemistry, Stanford University, 1902-06; Student in Heidelberg, Leipzig, and Breslau, 1902-04; Chief of Division of Weights, Measures and Mineral Analysis, Bureau of Science, Philippine Government, Manila, since 1906; Acting Professor of Chemistry, University of Montana, September 1, 1909, to June 1, 1910.

JOSEPH EDWARD KIRKWOOD, Ph. D. . . . 325 Tremont St.

Assistant Professor of Botany and Forestry.

A. B., Pacific University, 1898; A. M., Princeton University, 1902; Ph. D., Columbia University, 1903; Fellow in Biology, Princeton University, 1898-99; New York Botanical Garden, 1899-1901; Assistant in Botany, Columbia University Summer

School, 1900; Assistant in Biology, Teachers College, 1900-01; Instructor in Botany, Syracuse University, 1901-03; Associate Professor of Botany, 1903-07, and Professor of Botany, 1907; Assistant Botanist, Department of Investigation, Continental-Mexican Rubber Co., 1907-08; Carnegie Institution, Desert Laboratory, Tucson, 1908-09; Assistant Professor of Botany and Forestry, University of Montana, since September 1, 1909.

GEORGE FULLMER REYNOLDS, Ph. D. . 315 University Avenue

Assistant Professor of English and Rhetoric.

Ph. B., Lawrence College, 1898; Ph. D., University of Chicago, 1905; Teacher of English, Weyauwega, Wis., High School, 1898-99; Teacher of English, Chicago Manual Training School, 1900-01; Fellow in English, University of Chicago, 1901-02; Head of English Department, Shattuck School, Faribault, Minn., 1902-09; Assistant Professor of English and Rhetoric, University of Montana, since September 1, 1909.

JOHN KURTZ WITZMAN . . . . . 335 Stephens Ave.

Acting Director of Music.

Pupil of Gilbert Coombs, Broad Street Conservatory of Music, Philadelphia; also of Adam Geibel; Choirmaster, St. John's Church, Philadelphia, 1884-96; orchestra experience of twenty years; Acting Director of Music, University of Montana, February to April, 1910.

ELOISE KNOWLES, Ph. B. . . . . South 2nd St. West

Instructor in Drawing.

Boston Art School, 1892-93; Ph. B., University of Montana, 1898; Chase Art School, Shinnecock Hills, 1899; School of Education, University of Chicago, 1904; Art Institute, Chicago, 1904; Columbia University, 1909; University of Chicago, 1910; abroad, summers of 1903 and 1906; Instructor in Drawing, University of Montana, since 1898. (Absent on leave, 1909-10).

MARY STEWART, A. B. . . Woman's Hall, University Grounds

Dean of Women and Instructor in Latin and English.

A. B., University of Colorado, 1900; Instructor in State Preparatory School, 1900-01; Principal of Longmont High School, Colorado, 1901-05; Instructor in East Denver High School, 1905-07; Student, Columbia University, summer of 1908; Dean of Women, University of Montana, since 1907.

GERTRUDE BUCKHOUSE, B. S. . . . . 206 S. 4th St. West

Librarian.

B. S., University of Montana, 1900; Illinois State Library School, 1900-01; Special Course in Government Documents, Wisconsin State Library Commission, 1902; Librarian, University of Montana, since 1902.

JAMES WOODMANSEE RHODES . . . . 218 S. 6th St. East

Director of Physical Culture.

Student, University of California, 1900-02, Summer Schools, 1899, 1903, 1907, and Medical College, 1901; Student Assistant in Physical Culture, University of California, 1901-03; Director, Mrs. P. A. Hearst's College Settlement Gymnasium, Berkeley, Cal., 1900-04; Director of Physical Culture and Athletics, High School, Oakland, Cal., 1901-04; Director of Physical Culture, Miss Horton's Private School, Oakland, Cal., 1903; Director of and conducted work in Physical Culture, University of California Summer Schools, 1903, 1904, 1906, 1907; Instructor in Physical Culture, University of California, 1904-08; Director of Physical Culture, University of Montana, since September 1, 1908.

JAMES BERYL SPEER, B. A. . . . . 629 University Avenue

Acting Registrar and President's Secretary.

B. A., University of Montana, 1908; President's Secretary, 1908-09; Acting Registrar and President's Secretary, Secretary of the Faculty, since September 1, 1909.

ALLSTON DANA, A. B., S. B. . . . . S. 2nd St. West

Instructor in Engineering.

A. B., Harvard, 1906; Draughtsman, American Bridge Company, Elmira, N. Y., 1907; S. B., Massachusetts Institute of Technology, 1908; Assistant in Engineering, University of Montana, 1908-09, and Instructor in Engineering, since September 1, 1909.

WALTER ARTHUR, A. B., B. S. . . . . 402 Eddy St.

Instructor in Chemistry.

A. B., University of Missouri, 1907; B. S., in Education, Teacher's College, University of Missouri, 1907; Assistant in Chemistry, University of Missouri, 1905-06; Professor of Science, Westfield College, 1906-07; Teaching Assistant, University of Michigan, 1907-08; Assistant in Chemistry, University of Montana, 1908-09, and Instructor in Chemistry, since September 1, 1909.

EUGENE F. A. CAREY, B. S. . . . . 522 Rollins Street

Instructor in Mathematics.

B. S., University of California, 1905; Reader in Mathematics, University of California, 1905, Graduate Student, 1905-09, Assistant in Physics, 1905-07, Instructor in Matriculation Physics, Summer Session, 1907, and Assistant in Mathematics, 1907-09; Instructor in Mathematics, University of Montana, since September 1, 1909.

ROBERT NEAL THOMPSON, B. S. . . . 319 University Avenue

Instructor in Physics.

B. S., University of Nashville, 1905; Grammar Principal, Montgomery Bell Academy, Nashville, 1903-06; Assistant in Biology, University of Nashville, Summer, 1906; Student, University of Chicago, 1906-09; Acting Associate Professor of Physics, Oberlin College, 1908; Instructor in Physics, Chicago University High School, 1909; Instructor in Physics, University of Montana, since September 1, 1909.

MABEL ROCKWELL SMITH, M. A. . . . 300 University Avenue

Instructor in Elocution and Physical Culture.

B. A., Western College, 1901, and M. A., 1907; Student, Columbia School of Oratory, 1901-03, and Northwestern University, 1907-08; Instructor in Public Speaking and Literature, Campbell College, Kansas, 1903-05; Teacher of Public Speaking and Literature, High School, Toledo, Iowa, 1905-07; Instructor in Elocution and Physical Culture, Dakota Wesleyan University, 1908-09; Instructor in Elocution and Physical Culture, University of Montana, since September 1, 1909.

MARGERY WINNIFRED FEIGHNER, B. A. . 315 East Front St.

Assistant Librarian.

B. A., University of Montana, 1908; Student, Library School, Simmons College, 1908-09; Assistant Librarian, University of Montana, since September 1, 1909.

SPECIAL LECTURERS IN FORESTRY

WILLIAM B. GREELEY . . . District Forester, District No. 1
A. B., University of California, 1901; M. F., Yale University, 1904.

C. H. ADAMS . . . . . Assistant District Forester in Charge of Grazing, District No. 1

EDWARD C. CLIFFORD . . . Chief of Planting, District No. 1
B. S., University of Maine, 1904; University of Michigan, 1906.

G. A. FITZWATER . Deputy Supervisor, Absaroka National Forest
M. F., Yale University, 1908.

J. F. JARDINE . . . . Grazing Expert of the Forest Service

M. J. KNOWLES . . . . . State Veterinarian

R. G. POND . . . Deputy Supervisor, Missoula, National Forest
Biltmore Forest School, 1906.

W. G. WEIGLE . . . Supervisor, Coeur d'Alene National Forest
Yale Forest School, 1904.

STUDENT ASSISTANTS

MILLARD S. BULLERDICK . . . . . Assistant in Biology
DANIEL M. CONNER . . . . Assistant in Engineering Shops
HUGH T. FORBIS . . . . . Assistant in Geology
LAURA S. JOHNSON . Assistant in History, and in President's Office
ERNEST K. LOVETT . . . . . Assistant in Chemistry
ARTHUR W. O'ROURKE . . . . Assistant in President's Office
DAISY M. PENMAN . . . . . Assistant in Psychology
DUDLEY D. RICHARDS . . . . . Assistant in Mineralogy
EDNA P. ROSEAN . . . . . Assistant in Library
ROBERTA SATTERTHWAITE . . . . . Assistant in Library

EMPLOYES

RICHARD KESSLER . . . . . Engineer
THEODOR KESSLER . . . . . Assistant Engineer
J. L. SPOHN . . . . . Gardener
MANTLE VINEYARD . . . . . Janitor
MAX KRANICH . . . . . Watchman
LUCILE BREWER . . . . . Matron of Woman's Hall

STANDING COMMITTEES OF THE FACULTY, 1909-1910.

On Admission and Registration:
Aber, Corbin, Plant, Richter, Rowe

On Schedule and Examinations:
Aber, Book, Carey, Dana, Kirkwood.

On Student Affairs:
Elrod, Reynolds, Richter, Scheuch, Stewart.

On Athletics:
Rhodes, Dana, Plant, Smith, Thompson.

On Public Exercises:
Underwood, Corbin, Kirkwood, Scheuch, Smith.

On Graduate Work:
Elrod, Cox, Reynolds, Rowe, Underwood.

On Interscholastic Meet:
Rowe, Aber, Book, Elrod, Reynolds, Rhodes, Stewart.

On Recommendations:
Book, Corbin, Plant.

On Public Accountancy:
The President, Plant, Underwood.

On State Fair Exhibit:
Aber, Arthur, Book, Elrod, Rowe.

The President is ex-officio a member of all Committees.

GENERAL INFORMATION

HISTORICAL SKETCH

The University of Montana had its origin in a grant of seventy-two sections of land made by the federal government to the state of Montana for University purposes. It was provided that the land should be used to form a principal that could never be diminished, and the income from which would form a fund to be applied to the maintenance of the University.

The legislative act providing for the organization of the University bears date of February 17, 1893. In accordance with the provisions of the state constitution this act placed the University under the control of the State Board of Education. This act also gave general directions concerning the organization of the different departments of the University, the courses of instruction, duties of the president, fees, etc.

At the December meeting, 1894, the University committee of the State Board of Education reported in favor of opening the University in September, 1895. In order to facilitate the opening of the University the citizens of Missoula donated the use of their South Side public school building to the state until permanent buildings could be constructed. About $3,500, raised by special tax, was spent in improving this building and in putting it in proper order for the use of the state.

A local executive committee was appointed to assist the board in their work. This committee, consisting of J. H. T. Ryman, Judge Hiram Knowles and Col. T. C. Marshall, all of Missoula, served without any change in its membership until April 19, 1909, when the newly created Executive Board began its functions.

The University was formally opened with appropriate ceremonies on Wednesday, September 11, 1895.

Arbor Day, 1896, is a memorable day in the history of the University, for on this day the grounds, donated to the state by Mr. E. L. Bonner and Mr. F. G. Higgins, and fenced by the Missoula Board of Trade, were dedicated to University purposes.

The Legislative Assembly of 1897 gave the University authority to issue bonds to the amount of $100,000, bearing not more than 6 per cent interest, due in thirty years and payable in twenty. These bonds, secured by the income from the University lands, were sold at a premium, a building commission was appointed, and the work of providing buildings was undertaken.

Two buildings were then constructed, one known as University Hall, containing the library, museum, assembly room, class rooms, and president's office; the other, known as Science Hall, containing the necessary rooms for science and work in engineering as well as the steam plant for heating the buildings and furnishing power for the engineering laboratory. These buildings were completed and formally presented to the State Board of Education, February 18, 1899.

The Legislative Assembly of 1901 authorized the issuing of $70,000 additional in 5 per cent bonds, due in thirty years and payable in twenty. It was also provided that $40,000 of these bonds should be issued at once and the remainder at the discretion of the State Board of Education. With the proceeds of this bond issue Woman's Hall and a Gymnasium were erected and equipped.

Before the remaining $30,000 were sold the Attorney General of Montana gave an opinion, which was sustained by the Supreme Court of Montana and also by the Supreme Court of the United States, that the income from the lands could not be applied to payment of interest and principal of building bonds, but must be devoted to the maintenance of the University. In accordance with this decision the General Assembly of 1907 passed an act looking to the assumption of this bonded debt by the state, and for the purpose of placing intact the permanent endowment funds of educational institutions. By favorable action of the voters at the general election in 1908, the legislative act was ratified, with the result that the endowment of the University is to be preserved unimpaired.

The General Assembly of 1909 provided for the creation of separate "Interest and Income Funds," of each of the State's educational institutions, to be derived from the interest on permanent funds and the leasing of lands. The law directs that these funds are to be used in the payment of claims for the maintenance of the several institutions.

The General Assembly of 1907 granted to the University an appropriation of $50,000 for a Library building and $10,000 for enlargement of heating plant and other improvements. These appropriations were expended under the direction of John M. Evans, J. H. T. Ryman and Dr. O. J. Craig, Building Commissioners, and the building was formally presented to the State Board of Education on February 19, 1909.

A special appropriation of $7,500, made by the General Assembly of 1909, for the purpose, provided for the furnishing of the Library building.

LEGISLATIVE ENACTMENTS

The most significant portions of the laws of Montana in force with respect to the University are as follows:

"666. (1540). **University of Montana Established.**—The University of Montana is established and located at Missoula, and has for its object, instruction and education in all the departments of science, literature, art, industrial and professional pursuits." [Revised Codes, 1907].

"Section 1. The state board of education, as now created by law, shall have power and it shall be its duty:

"1. To have the general control and supervision of the University of Montana. . . . . .

"11. To have, when not otherwise provided by law, control of all books, records, buildings, grounds and other property of the institutions and colleges named in this section.

"12. To choose and appoint a president and faculty for each of the various state institutions named herein, and to fix their compensation; . . . . . .

"13. To confer upon the executive board of each of said institutions such authority relative to the immediate control and management, other than financial, and the selection of the faculty, teachers and employes as may be deemed expedient, and may confer upon the president and faculty such authority relative to the immediate control and management, other than financial, and the selection of teachers and employes as may by said board be deemed for the best interests of said institution.

"Section 2. There shall be an executive board, consisting of three members, for each of said institutions, two of whom shall be appointed by the governor, by and with the advice and consent of the state board of education, and the president of such institution shall be ex-officio a member of said board and shall be chairman thereof. At least two of said members shall reside in the county where such institution is located. Said executive board shall have such immediate direction and control, other than financial, of the affairs of such institution as may be conferred on such board by the state board of education, subject, always, to the supervision and control of said state board.

"Said executive boards shall also have and exercise power and authority in contracting current expenses and in auditing, paying and reporting bills for salaries, or other expenses incurred in connection with such institution, provided, the Board of Examiners may not limit the power of the Executive Board in making expenditures or contracts which in no single instances or for any single purpose does not exceed Two Hundred and Fifty Dollars. All vacancies occurring in the membership of any of said executive boards shall be filled by appointment by the governor, which appointments shall be referred to the state board of education at its first meeting thereafter for confirmation.

"Section X. The ex-officio member of each of said executive boards shall hold his office during his continuance as president of such institution, and the two members appointed by the governor shall hold office for the term of four years from and after the third Monday in April, 1909, unless sooner removed by the governor or by the state board of education; provided, that of the members of the executive board first appointed under the provisions of this act, one shall be

appointed for the term of two years and one for the term of four years. Such members shall qualify by taking and filing their oath of office with the state board of education.

"Section XIII. The state board of examiners of the state of Montana shall have supervision and control of all expenditures of all moneys appropriated or received for the use of said colleges from any and all sources, ... and said state board of examiners shall let all contracts, approve all bonds for any and all buildings or improvements, and shall audit all claims . . . . . but said state board of examiners shall have authority to confer upon the executive boards of such institutions such power and authority in contracting current expenses and in auditing, paying and reporting bills for salaries or other expenses incurred in connection with said institution as may be deemed by said state board of examiners to be to the best interests of said institutions." [Session Laws, 1909, Ch. 73.]

"671. . . . . No sectarian or partisan test shall ever be allowed or exercised in the appointment of professors, instructors, officers or employes of the University, or in the admission of students thereto, or for any purpose whatever. No instruction, either sectarian or religious or partisan in politics, shall ever be allowed in any department in the university.

"676. . . . . The university shall be open to students of both sexes, under such regulations and restrictions as the state board of education may deem proper.

"677. . . . . Tuition shall ever be free to all students who shall have been residents of the state for one year next preceding their admission, except in the law and medical departments, and for extra studies. The state board of education may prescribe rates for tuition for any student in the law or medical departments, or who shall not have been a resident aforesaid, and for teaching such studies.

"679. . . . . For the support and endowment of the university there is annually and perpetually appropriated:

"1. The university fund income and all other sums of money appropriated by law to the university fund income.

"2. All tuition and matriculation fees.

"3. All such contributions as may be derived from public or private bounty." [Revised Codes, 1907.]

POWERS OF THE EXECUTIVE BOARD

The following regulations, passed by the State Board of Education on June 8, 1909, define the functions and powers of the Executive Board:

"The Executive Board of all State Educational Institutions shall have immediate direction and control of the affairs of such institutions, subject only to the general supervision and control of the State Board of Education, and, as to financial matters, of the State Board of Examiners.

"It is authorized to choose and appoint professors, teachers, instructors, assistants and other employes, for such institutions, who

shall serve as such for such time, and receive such compensation as the said Executive Board may prescribe, subject to the approval of the State Board of Education.

"It shall keep such books or cause the same to be kept by its Secretary and Treasurer, or other officer which it shall prescribe, as may be necessary to keep full, true and complete accounts of the moneys received and expended by it in the management of said institution, and shall make the reports prescribed by Chapter 73, Laws of 1909, and shall furnish the estimates to the State Board of Education and the State Board of Examiners provided by Chapter 120, Laws of 1909."

THE UNIVERSITY CAMPUS

The University campus proper is forty acres in extent, and lies near the southeastern limit of the city of Missoula, at the base of the hills which enclose the eastern end of the valley. To the north lies the Missoula river; westward stretches a wide plain, whose western and southern horizons are bounded by the Bitter Root Mountains. The main entrance to the campus is at the western side, from University avenue. Trees, lawns, shrubbery, flowers, walks and driveways, make an attractive setting for the buildings.

To the eastward, on the steep slopes of Old Mount Sentinel and rising to two thousand feet above the plain, the University possesses six hundred acres of land which are at present unimproved.

BUILDINGS

University Hall, the largest building, stands on the east side of the oval, directly opposite the entrance to the driveway and facing the west. A little to the south stands Science Hall, which faces toward the northwest. Still farther west, and directly south of the oval, is Woman's Hall. To the northeast of University Hall and at a distance of two hundred feet is the gymnasium. The new Library building is situated on the north side of the oval. With the exception of the gymnasium, all these buildings are constructed of brick and stone and face the large oval near the middle of the campus.

University Hall is 140 by 65 feet in its ground dimensions, and its central tower rises to a height of one hundred and twelve feet. This building has four floors, including the basement, which is largely above the ground and well lighted. The basement walls are of granite; above rise double brick walls of substantial character; the inner partition walls are also of brick. The whole building contains thirty-one rooms, without including six small rooms in the rear of the Assembly Hall, serving as

cloak rooms and offices and giving access from the rear to the platform of Assembly Hall.

Science Hall contains in the first floor eight rooms, equipped for the Department of Engineering. Eight rooms on the second floor are occupied by the Department of Chemistry. In the basement are the boilers for the heating plant of all the buildings, and the engine which runs the machinery of the shops.

The Woman's Hall was constructed to furnish a home for women students. It is 136 by 46 feet in its ground dimensions and has four floors, including the basement, which is so largely above ground as to be well lighted. In the basement are the dining room, kitchen, laundry room, storage rooms, etc. The first floor contains the office, parlors and some students' rooms. The second and third floors are entirely devoted to students' rooms. On each floor are closets and bath rooms. The entire building is well furnished and amply supplied with electric lights, steam heat and every sanitary convenience.

The Gymnasium, north of University Hall, is 114 by 58 feet in its ground dimensions, the main floor being 114 by 43 feet. In the rear of this are dressing and bath rooms for men and for women. These are supplied with hot and cold water, and the building is lighted by electricity and heated with steam radiators. In the rear of the building, facing the track and athletic grounds, is a commodious grandstand and extensive bleachers.

The new Library building is 86 by 56 feet, and contains the general library, and also the Museum and several class rooms and offices. Its furniture and equipment are new and modern.

An Infirmary specially designed for the isolation and care of students who may be suffering from contagious or infectious diseases, has been contracted for and is being constructed.

UNIVERSITY SURROUNDINGS.

Missoula is located in Western Montana, on the Chicago, Milwaukee and Puget Sound Railroad and on the main line of the Northern Pacific Railroad at its junction with the Bitter Root valley and Coeur d'Alene branches, thus affording easy railroad connection with all parts of the state and the northwest.

The City of Missoula is noted as being one of the most beautiful in Montana, and is unexcelled as regards pure water, healthful surroundings and beautiful scenery. Situated at the head of the Missoula valley and near the outlet of the Bitter Root valley, it is within the limits of a great agricultural and fruit growing region.

ADMISSION REQUIREMENTS

September of 1909 marked a new era in the University of Montana. Since only work of collegiate grade is offered by its faculty, the completion of a four-years' preparatory or high school course is the standard for regular entrance to the Freshman class. This must include at least 15 units of work. The term unit of work means one subject pursued for at least 36 weeks with not less than 5 recitations per week, of not less than 40 minutes each.

Applicants must be at least sixteen years old and must present evidence of good moral character.

A good preparation for beginning the University work should include in the 15 units the following: 3 or 4 units of Mathematics; 4 units of English; 2 to 4 units of language other than English; 2 units of History; 1 or 2 units of Science.

Students planning to enter the Department of Engineering should include Physics and four years of Mathematics in their preparation.

ADMISSION ON CERTIFICATES

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given to each and grades obtained.

Blanks for such certificates are furnished by the University. These should be filed in the President's office on or before the first day of registration.

Entrance credit is given for all subjects in the official courses of study for Montana high schools, which are properly certified as having been taken by the applicant. Subjects other than those in the official courses may be recognized for credits upon application in each case.

Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates stating the same points as those given from accredited schools. Similar blanks are furnished by the University.

When the evidence of certificates is not clear and satisfactory, examinations will be given.

ADMISSION ON EXAMINATION

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar of the University. For the academic year 1910-11 these days are September 12 and January 30.

Those who are preparing to take entrance examinations should follow the appended outline descriptions of courses as commonly given in accredited schools:

I. ALGEBRA.—Fundamental operations (including special rules for multiplication and division); factoring; highest common factor and lowest common multiple by factoring; fractions; linear equations (integral, fractional, simultaneous); involution and evolution; quadratic equations (including simultaneous); graphical representation and solution of equations; radicals; theory of exponents; imaginary numbers; ratio and proportion; arithmetic progression; geometric progression; theory of logarithms. (One and one-half units).

II. GEOMETRY, PLANE AND SOLID.—The equivalent of the subject matter in any of the standard texts, supplemented by some such work as Estill's "Numerical Problems in Plane Geometry." (One and one-half units).

III. ENGLISH.—

(1) Composition.—The applicant must have the equivalent of the English composition required in a four years' high school course. Serious deficiency in spelling, punctuation, form, sentence-structure, grammatical inflections, or clearness of thought, will be sufficient ground for rejection of the applicant's work.

(2) Literature.—The applicant should have thorough preparation in the books for reading and study as prescribed by the National Conference on Uniform Entrance Requirements in English.

IV. HISTORY.—

One unit of history should embrace the history of ancient nations, with special reference to Greece and Rome. Myers or West or equivalent.

The second unit should embrace the history of mediaeval and modern Europe. Myers or West or equivalent.

Third unit may be in English history. Andrews or equivalent.

The fourth should embrace American history, Channing or equivalent; and civil government, Fiske or equivalent.

V. LATIN.—Two units in Latin should cover the work of a good beginning Latin book and the reading of four books of Caesar's Gallic War.

Three units should include the above and five orations of Cicero.

Four units should give in addition the reading of six books of Vergil's Aeneid. There should also be practice in writing Latin during the reading of the texts above mentioned. Systematic grammatical instruction and drill by illustration. Composition exercises should be given throughout the work.

VI. GERMAN.—Grammar, Joyne's-Meissner, Whitney's, or their equivalents. Ability to read easy prose fluently, and to translate at sight such work as "Hauff's Maerchen" (Goold). (Two or three units).

VII. FRENCH—Grammar, Chardenal's Complete, Edgren's, or their equivalents. Ability to read easy prose fluently and to translate at sight such work as "La Pierre de Touche" (Harper). (Two or three units).

VIII. PHYSICS.—One year of Elementary Physics, the equivalent of Carhart and Chute's Elementary Physics, Gage's Principles of Physics, or Avery's Elements, one-half of the time having been devoted to laboratory work. The student's note book in laboratory practice will be considered evidence of having done this work.

IX. BIOLOGY.—One year's work in Biological Science, with half the time given to Laboratory work, the equivalent of Davenport's Elementary Zoology, or Linville and Kelley's Elementary Zoology, for class; and Kingsley or Colton in Laboratory, with accompanying special reading or study.

X. CHEMISTRY.—One year's work, the equivalent of Remsen's Beginning Course. One-half of the time must be given to laboratory work, as certified by student's note book.

CONDITIONAL ADMISSION

The entrance requirement of the completion of a four years' preparatory course with at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of students otherwise qualified if they are entitled to at least thirteen admission units.

Entrance conditions must be removed within one year from time of admission.

This may be accomplished by private study or tutoring and the passing of entrance examinations; by arranging to take the requisite courses in the regular classes of the Missoula County High School; or by transferring certain University credit hours and counting them toward entrance standing instead of toward graduation.

ADMISSION OF SPECIAL STUDENTS

Mature persons may be admitted without the usual entrance units as special students, not candidates for degrees, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired.

Special students may acquire status as regular students and become candidates for degrees upon complying with the rules applicable to such cases.

ADMISSION TO ADVANCED STANDING

Students entering from collegiate departments of other colleges and universities must bring certificates of honorable dismissal. Upon presentation of the proper certificates they will receive college credit for courses taken in institutions of approved standards.

ACCREDITED HIGH SCHOOLS

The State Board of Education in a meeting held June 1, 1896, passed the following regulations, which are still in force:

"Any high school or academy whose course of instruction covers the branches requisite for admission to one or more of the courses of any State educational institution may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a committee appointed by the State Board of Education. Application for such examination may be made by any school board to the Secretary of the State Board of Education, whereupon a committee appointed by the State Board of Education will examine the course of study and methods of instruction of the school and on the committee's favorable recommendation, and the concurrence of the State Board of Education, it will be entered upon the accredited list of the state educational institution for which it applied. Any graduate of such an approved school will be received by the president of the state educational institution wherein said graduate is entitled to enter, on presentation of proper diploma and certificate from the superintendent of said school, into any of the courses of said institution for which said graduate has been fitted.

"Students of any accredited school who are not graduates must expect examinations as other candidates.

"A school once entered upon the accredited list will remain there until its administration is changed, or until notice is given by the State Board of Education of unsatisfactory results. Upon a change of administration application for continuation upon the list, if desired, must be made. If the work of the principal coming into charge has been recently examined in connection with some other school, a new examination may not be required, but such examination should in all cases be invited.

"Annual reports will be asked for by the State Board of Education from all accredited schools."

By subsequent action the President of the University was appointed Inspector of High Schools, and the State Superintendent of Public Instruction was designated as Associate Inspector.

In December, 1906, the Board appointed a committee "to formulate a uniform plan for accredited high schools." The committee formulated a plan and a brief outline of work for accredited high schools, which was adopted.

Also, the committee recommended to the Board that "the work of the eight grades, when arranged, shall be the standard for entrance to the high schools." This recommendation, which

was adopted by the Board, became of effect in 1899, when the State Common School Course of Study was published and placed in the hands of school boards, teachers and superintendents.

In June, 1899, the State Board of Education instructed the Diploma Committee to revise the course of study for accredited high schools. At the December meeting the committee asked for further time, which was granted. At the regular meeting of the Board in June, 1900, the Diploma Committee reported a three years' course of study, which was adopted.

In December, 1905, the President of the University recommended that the Preparatory Department of the University be discontinued after September 1, 1908, and that at this date the accredited High Schools be required to sustain a four years' course of study. The recommendation was adopted, and a committee was appointed to prepare a four years' course of study for accredited high schools. The following course was prepared, reported to the Board, and formally adopted December 4, 1906:

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

FIRST YEAR—FIRST SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin—	Latin—	Word Study and Grammar, or Latin.	Word Study and Grammar, or Latin.
First Lessons.	First Lessons.	Algebra.	Algebra.
Latin Grammar.	Latin Grammar.	Physiography, or History—	Physiography, or History—
Algebra.	Algebra.	Eastern Nations and Greece.	Eastern Nations and Greece.
History—	Physiography, or History—	English—	English—
Eastern Nations and Greece.	Eastern Nations and Greece.	Composition and Rhetoric.	Composition and Rhetoric.
English—	English—	American Authors.	American Authors.
Composition and Rhetoric.	Composition and Rhetoric.	Drawing—	Drawing—
American Authors.	American Authors.	Twice a week.	Twice a week.
Drawing—	Drawing—		
Twice a week.	Twice a week.		

FIRST YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin—	Latin—	Word Study and Grammar, or Latin.	Word Study and Grammar, or Latin.
First Lessons.	First Lessons.	Algebra.	Algebra.
Latin Grammar.	Latin Grammar.	English—	English—
Algebra.	Algebra.	Composition and Rhetoric.	Composition and Rhetoric.
English—	English—	American Classics.	American Classics.
Composition and Rhetoric.	Composition and Rhetoric.	Physiology, or Roman History.	Physiology, or Roman History.
American Classics.	American Classics.	Drawing—	Drawing—
History—	History—	Twice a week.	Twice a week.
Roman.	Roman.		
Drawing—	Drawing—		
Twice a week.	Twice a week.		

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

SECOND YEAR—FIRST SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin—	Latin—	Latin, or Botany.	Commercial Arithmetic.
Caesar.	Caesar.	Algebra.	Commercial Geography.
Algebra.	Algebra.	English—	English—
English—	English—	Composition and Rhetoric.	Composition and Rhetoric.
Composition and Rhetoric.	Composition and Rhetoric.	American and English Authors.	American and English Authors.
American and English Authors.	American and English Authors.	History—	History—
History—	History—	Mediaeval.	Mediaeval.
Mediaeval.	Mediaeval.	Drawing—	Drawing—
Drawing—Twice a week.	Drawing—	Twice a week.	Twice a week.
	Twice a week.		

SECOND YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin—	Latin—	Latin, or Botany	Commercial Arithmetic.
Caesar.	Caesar.	Plane Geometry.	Plane Geometry.
Plane Geometry.	Plane Geometry.	English—	English—
English—	English—	Composition and Rhetoric.	Composition and Rhetoric.
Composition and Rhetoric.	Composition and Rhetoric.	American and English Authors.	American and English Authors.
American and English Authors.	American and English Authors.	History—	History—
History—	Botany, or Modern History.	Modern.	Modern.
Modern.	Drawing—	Drawing—	Drawing—
Drawing—	Twice a week.	Twice a week.	Twice a week.
Twice a week.			

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

THIRD YEAR—FIRST SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin— Cicero. Plane Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Plane Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Latin. French. German. English History. } Select two.	Bookkeeping. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Stenography and Typewriting.

THIRD YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin— Cicero. Solid Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Solid Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Solid Geometry, or Economics. English— Composition and Rhetoric. American and English Authors. Latin. French. German. English History. } Select two.	Economics. Bookkeeping. English— Composition and Rhetoric. American and English Authors. Stenography and Typewriting.

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

FOURTH YEAR—FIRST SEMESTER

Classical Course.	Scie tific Course.	English Course.	Commercial Course.
Latin—	Trigonometry.	Physics.	Correspondence.
Vergil.	Physics.	English—	Bookkeeping.
English—	English—	History of English Literature.	American History and Civics.
History of English Literature.	History of English Literature.	American History and Civics.	Stenography and Typewriting.
American History and Civics or French, or German.	American History and Civics or French, or German.	French. } German. } Latin. } Trigonometry. } Select two.	
Physics.			

FOURTH YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin—	Physics.	Physics.	Commercial Law.
Vergil.	English—	English—	Bookkeeping.
English—	Masterpieces with applications of principles of English Grammar.	Masterpieces with applications of principles of English Grammar.	American History and Civics.
Masterpieces with applications of principles of English Grammar.	American History and Civics, or French, or German.	American History and Civics.	Stenography and Typewriting.
American History and Civics, or French, or German.	Mathematics—	Commercial Law } Mathematics. } French. } German. } Latin. } Select two.	
Physics.	Review.		

LIST OF ACCREDITED HIGH SCHOOLS

(1909-1910)

City	Principal
Anaconda	A. P. Hickson
Billings	J. A. Dallas
Butte	G. F. Downer
Chinook	G. H. Willman
Columbus	James H. Doyle
Forsyth	J. E. Baltzell
Fort Benton	J. W. Lenning
Glasgow	D. S. Williams
Great Falls	A. D. Wiggin
Havre	T. J. Troy
Helena	A. J. Roberts
Virginia City	D. S. Clinger

County	Principal
Beaverhead—Dillon	L. R. Foote
Broadwater—Townsend	John M. Kay
Carbon—Red Lodge	A. C. Carlson
Custer—Miles City	J. A. Burger
Dawson—Glendive	Ralph L. Hunt
Fergus—Lewistown	H. L. Sackett
Flathead—Kalispell	G. A. Ketcham
Gallatin—Bozeman	E. J. Parkin
Granite—Philipsburg	G. T. Bramble
Jefferson—Boulder	H. E. Harry
Missoula—Missoula	J. F. Thomas
Park—Livingston	Lewis Terwilliger
Powell—Deer Lodge	C. W. Street
Sweet Grass—Big Timber	W. C. Ryan
Teton—Choteau	B. E. Toan

Private Schools

Parochial High School—Butte	Rev. S. J. Sullivan
Sacred Heart Acadamy—Missoula	Sister Mary Loretta

REQUIREMENTS FOR GRADUATION

The organization of courses of study within the University was quite changed in 1909 by action of the Faculty. Instead of the fundamental principle of the "group system," with elective elements, the principles of "elective" and "major department" systems have been fused and adopted. These are modi-

fied by certain general prescriptions, and by provisions looking to careful administration.

For graduation a student must complete 122 credit hours of work, including 2 credit hours for required physical culture. One credit hour represents three hours of time each week throughout one semester, occupied in recitations or lectures and in preparation outside of the class room.

Time given to laboratory work is credited on the same basis of valuation, "three hours for one."

Students in the professional schools must complete the work required in those schools, but calculated upon a basis of not less than a total of 122 credit hours.

REQUIRED AND ELECTIVE WORK

Required of all:—

2 Courses in English Composition ..... 4 to 6 hours
4 Courses in Physical Culture (2 exercises per week for 2 years) ..... 2 hours

Restricted Electives:—

2 Courses in Science ..... 6 to 10 hours
4 courses in Language other than English..... 12 to 20 hours
2 Courses in History or Economics..... 6 to 10 hours
2 Courses in Literature or Philosophy ..... 6 to 10 hours

Major Department Electives:—

Not later than the Junior year, every student must choose a major department. This department may command from 30 to 40 hours of the student's time, including the hours in this department taken in the restricted electives given above. The major professors define their prescriptions for each student.

Free Electives:—

The rest of the 122 required hours are entirely free electives. These will be from 58 to 26 hours according to whether the minimum or maximum number of hours are taken in required subjects, the restricted electives and the major department.

Until choice of a major department is made, a student's electives are subject to the advice of an appointed Faculty adviser; after this choice, the head of the department chosen becomes the adviser.

Requirements beyond English Composition and Physical Culture do not apply to students in professional schools, since these departments definitely prescribe their work.

BACCALAUREATE DEGREES

Upon the successful completion of undergraduate courses the University confers degrees of Bachelor of Arts, or Bachelor of Science, or Bachelor of Science in Engineering.

Requirements for the degrees of Bachelor of Arts and Bachelor of Science are not minutely defined, but they are set forth in the preceding section on "Requirements for Graduation." In all except professional departments the work of the University is so organized that the determination of his course for each student is largely an individual problem.

THE DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING

The following scheme of courses gives the requirements for the degree of B. S. in Engineering, and the years in which the courses are to be taken. At least one hundred and twenty credits, in addition to those prescribed in Physical Culture, must be completed. One hundred and nine of these credits are in prescribed courses, the balance are in courses to be elected by the student under the supervision of the Department of Engineering. In the prescribed work of the fourth year there are alternative groups of courses, between which the student must choose, one for those students who wish to specialize in Electrical Engineering, and the other for those wishing to specialize in Civil Engineering.

FIRST YEAR

First Semester	No.	Credits	Second Semester	No.	Credits
Mathematics	I	5	Mathematicts	II	5
Chemistry	I	4	Chemistry	II	4
Engineering, Drawing	Ia	2	Engineering, Drawing	I b	2
Engineering, Shop Work	II a	2	Engineering, Shop Work	II b	2
English	I	2	English	II	2
Physical Culture	I	½	Physical Culture	II	½

SECOND YEAR

First Semester	No.	Credits	Second Semester	No.	Credits
Mathematics	III	5	Mathematics	IV	3
Physics	I	4	Physics	II	4
Engineering, Desc. Geom.	I c	2	Engineering, Surveying	III b	2
Engineering, Surveying	III a	2	Engineering, Mechanics	V	3
Engineering, Mechanism	IV a	2	Engineering, Valve Gears	IV b	2
Physical Culture	III	½	Option		1 or 2
			Physical Culture	IV	½

THIRD YEAR

First Semester	No.	Credits	Second Semester	No.	Credits
Engineering, Mechanics	V a	3	Engineering, Hydraulics	VIII a	3
Engineering, Electricity	VI a	3	Engineering, Electricity	VI b	3
Engineering, Steam	VII a	2	Engineering, Steam and Gas	VII c	3
Engineering, Mechanics of Materials	V c	3	Engineering, Materials of Construction	V d	2
Geology	I	2	Geology, Economic		2
Option, Economics or Hist'ry		2 or 3	Technical Fuel and Gas Analysis	VII b	1
			Railway Engineering	IX a	2

FOURTH YEAR

Electrical, Mechanical and Civil Engineering

First Semester	No.	Credits	Second Semester	No.	Credits
Engineering, Hydraulics	VIII b	3	Engineering, Contracts and Specifications	XIII	2
Engineering, Electrical Laboratory	VI f	2	Engineering, Laboratory	VII i	1
Engineering, Steam Lab'ry	VII h	1	Engineering, Thesis	XII b	2
Engineering, Structures	X a	2	Engineering, Seminar	XII a	1
Engineering, Thesis	XII b	1	Inspection Tours		

For Electrical Engineering

Engin'r'g, Alt'nat'g Curr'ts	VI c	3	Engin'r'g, Alt'nat'g Curr'ts	VI d	3
" Machine Design	IV b	2	" Central Stations	VII d	3
" Steam Turbines	VII f	2	" Electrical Lab'ry	VI g	2
			One of the three following:		
			Engineering, Gas Engines	VII g	2
			" Refrigeration	VII e	2
			" Telephones	VI e	2

For Civil Engineering

Engineering, Railroads	IX b	3	Engineering, Bridge Design	X c	2
" Irrigation	VIII c	1	" Structures	X d	2
" Bridge Design	X b	2	" Water Supply and Sewerage	VIII e	2
" Sanitary	VIII d	2	" Hyd. Design	VIII f	1
			" R. R. Design	IX c	1

ADVANCED DEGREES

Work of advanced character, involving research, may be pursued after graduation. The several departments will make such provision for graduate courses as the qualifications of each student and the special circumstances may require.

For the present the University is not satisfactorily equipped to offer courses leading to the degrees of Doctor of Philosophy or Doctor of Science.

Degrees of Master of Arts, or Master of Science may be conferred in accordance with the following regulations:

1. The candidate for either of these degrees must be a graduate of the University of Montana or of some other university or college approved by the committee on graduate work.

2. At least one year of work in residence will be required. By special permission, however, a limited amount of the work may be done in absentia. If any student during his candidacy for a master's degree should engage in teaching or in other remunerative employment,

he may be required to devote to his work more than the normal time.

3. The candidate may pursue one major and two minors, one major and one minor, or may devote the entire time to the major. At least one-half of the candidate's work should be in the major study.

4. The head of the department in which the major study is selected shall be the adviser of the candidate; and shall assist the candidate in the selection of the minor studies. All courses of study must be approved by the committee.

5. The candidate within two weeks after registration will be required to fill out a blank form, provided for the purpose, stating the course of study to be taken. The topic for the thesis must be reported to the president's office, not later than eight weeks after the date of registration.

6. The thesis written by the candidate must show marked attainment in some branch of learning; and must be submitted, not later than May 1, to a special examining committee, appointed by the president, consisting of three members; the head of the department in which the major work is done, and two other members of the faculty. The candidate must pass an examination, either written or oral, or both, conducted by the same special examining committee.

7. The candidate, before receiving the degree, must give evidence of having a reading knowledge of some modern language bsides English, preferably German or French.

ADVANCED ENGINEERING DEGREES

For those wishing to devote more time to preparation for professional work graduate courses may be given by the Department of Engineering leading to the degrees of Mechanical, or Electrical, or Civil Engineer.

THE UNIVERSITY CERTIFICATE OF QUALIFICATION TO TEACH

The aims of the University in providing instruction in Education are as follows:

1. To fit certain University students for the higher positions in the public school service.

2. To encourage and promote the study of educational science.

3. To teach the history of education and of educational systems and doctrines.

4. To provide such courses of instruction as will secure to teaching the rights, prerogatives and advantages of a profession.

The requirements made by the Faculty for granting a University teacher's certificate are as follows:

1. **Special Prerequisite.**—The candidate must show special professional intention and interest, and possess some native fitness to teach.

2. **General Scholarship.**—Each candidate for such a teacher's certificate must hold a bachelor's or master's degree from this University.

3. **General Professional Knowledge.**—He must have taken the following special courses: Education I and II or III and IV, V and VI, and four hours selected from Philosophy VII and VIII, Education I, II, III, IV, VII and VIII.

4. **Special Professional Knowledge:**

a. The candidate must have made a special study of the subject or subjects he expects to teach, and have done, normally, 20 hours work in the special subjects in which he is commissioned to teach.

b. Have taken a course in special Methods in the secondary school subjects he expects to teach.

c. Have spent some time in observation and practice teaching under the direction of the head of the department of education and guidance of a special critic teacher of the subjects to be taught.

All candidates for the certificate should confer with the professor of education not later than the beginning of their third year.

FEES AND DEPOSITS

The University of Montana charges no general tuition fee, and there is no charge for any instruction except in the Department of Music.

An annual Matriculation fee of ten dollars must be paid on the day of registration.

An Athletic fee of one dollar per semester must be paid on the day of registration in each semester.

Exemption from the payment of the Matriculation and Athletic fees is granted to the student who had the highest rank in each graduating class of each accredited high school in the state. This exemption constitutes an Honor Scholarship extending through four undergraduate years.

In laboratory courses, and in certain other courses, deposits are required as security for payment of the cost of breakage and of materials supplied. These deposits must be paid within one month after the opening of each semester, and vary in amount from three dollars to ten dollars. After each of such courses is finished, the balances of deposits are returned.

From students previously matriculated who present themselves for registration after the official registration days (September 13, 1910, and January 31, 1911), a special Registration fee of two dollars is required. This special fee is increased to four dollars when registration is delayed more than one week after the official registration days.

EXPENSES

Women students who do not make their homes with their families in or near Missoula, are expected, as far as possible, to live in Woman's Hall. This building is well furnished, lighted, and heated, for its special purpose, and will comfortably house about sixty students. The University itself has the entire management of the Hall, making a combined charge of $25.00 per month for room and board. An extra charge of $2.00 per month must be paid by a single occupant of a room.

Men students are expected to find rooms and board in private families. By combining in club houses, either as fraternities or otherwise, young men may live at very reasonable rates. They may obtain meals at Woman's Hall at a uniform price of $4.25 per week.

Students will not be permitted to live in places not approved by the Faculty.

EMPLOYMENT FOR STUDENTS

A large number of students of the University earn either the whole or a part of their expenses while in college. Students intending to work their way can usually do so if they come with sufficient means to support them for the first half year, though many have made all their expenses from the beginning.

The University cannot guarantee work for students, but it is believed that those who are strong and willing to do any work that offers will not lack opportunities. A number of students find work about the University, as stenographers, assistants in the laboratories, in the library, or in Woman's Hall, as carpenters, and in other capacities. Others find employment in town as draftsmen, bookkeepers, clerks, reporters, janitors, newsboys, helpers in homes, etc.

While nothing is more efficient in obtaining work than the personal endeavors of the student, a committee of the Faculty will give every aid possible. Particular attention will be paid to the needs of new students. Those wishing employment during the coming year, and new students wishing information, should send their names, together with an account of the work they have done, the character of the work they wish to do, and the kind of positions they would be willing to fill, to the President.

During summer vacations, students readily find profitable employment in many occupations. The Forest Service in particular offers unusual opportunities for those who are studying that subject. Engineering students are in demand for surveying, etc., with railroad and construction companies.

SCHOLARSHIP AND CONDUCT

The University requires all of its students to manifest a serious purpose by maintaining satisfactory standing in the courses which they undertake. No student will be permitted to continue his connection with the University who shows persistent unwillingness or inability to comply with reasonable standards of scholarship. Regular students are expected to complete a minimum of eight hours credit in a given semester in order to register in a succeeding semester.

No prescriptive rules are formulated to control the conduct of students, but they are expected to conform to the usual standards of society and law-abiding citizenship.

SCHOLARSHIPS AND PRIZES

HONOR SCHOLARSHIPS

The student who holds the highest scholarly rank in each graduating class of each of the accredited high schools of the state is entitled to an Honor Scholarship in the University. These scholarships exempt the holders from the payment of Matriculation and Athletic fees throughout their four years' courses in the University.

BONNER SCHOLARSHIP

Mrs. E. L. Bonner, of Missoula, has generously endowed the Bonner Scholarship in honor of her husband, Mr. E. L. Bonner. It was awarded once in three years to that student who has most distinguished himself in scholarship during the Freshman year. The holder receives three hundred dollars annually for the remaining three years of his course in the University.

This scholarship is now held by Mr. Arthur O'Rourke, of Helena, Montana.

KEITH SCHOLARSHIP

By the gift of John M. Keith, of Missoula, a scholarship in the University, amounting to fifty dollars, is to be given annually to one of the high school debaters, selected from the twelve members of the four district championship teams of the Montana High School Debating League. The income of the scholarship will be paid to the student for one year, in two installments; one at the beginning of the first semester; the other, at the beginning of the second semester of the first year of his enrollment in the University.

Applications for the scholarship, directed to the President of the University, should be accompanied by credentials showing

the amount and quality of high school work done by the student, and by recommendations showing promise of the applicant's future usefulness. The scholarship can be granted only to a student who was a member of a high school class graduating in the year in which it was awarded.

BUCKLEY PRIZE IN ORATORY

This prize was founded by Dr. J. J. Buckley, of Missoula, in memory of his father, Mr. H. N. Buckley, and is awarded annually to the successful competitor in an oratorical contest, under conditions prescribed by the Faculty. The amount of the prize is twenty dollars. It was won in 1910 by Mr. Arbie E. Leech, of Choteau, Montana.

ANNIE LEWIS JOYCE MEMORIAL MEDAL

This prize was founded by Attorney M. M. Joyce, of Missoula, in memory of his wife, and is awarded annually for the best essay, thesis, or poem by an undergraduate.

BENNETT PRIZE ESSAY

Mr. Philo S. Bennett, of Bridgeport, Connecticut, set aside by will $10,000 to be distributed among twenty-five colleges or universities to be selected by Hon. W. J. Bryan, of Lincoln, Nebraska. The University of Montana received an endowment of $400, the annual proceeds of which will be given as a prize (in money or in a medal of equivalent value, at the option of the successful contestant) for the best essay by any student of the University, on some topic pertaining to good government.

The subject for 1910-11 will be, "The Experience of Cities under the Commission Form of Government."

COBBAN PRIZE IN GEOLOGY

Mr. R. M. Cobban, of Missoula, offers an annual prize of $25 to the student showing the best knowledge of geological subjects. It is open to advanced students only.

THE 1904 CLASS PRIZE

The endowment fund for this prize was donated by the members of the class of 1904, who, in rotation, name the particular excellence for which the prize shall be given. For the year 1904-05 it was awarded to the student holding the highest rank in the first year college class in Latin, and was won by Miss Cora Averill; for the year 1905-06, to the student representing the University in the state oratorical contest, won by Miss Olive Hall; for 1906-07, to the student making the greatest progress

in Chemistry, won by Dean King; for 1907-08, to the student having the highest standing in Economics, won by Frederick Greenwood.

MUSIC MEDALS

A medal is given annually in the Department of Music by Mrs. E. L. Bonner for advanced piano technique.

MISCELLANEOUS

UNIVERSITY PUBLICATIONS

Several series of Bulletins are published by the University, partly as official announcements and records, partly as contributions to science by various members of the Faculty. More detailed statements will be found upon the inner cover pages of this Register.

UNIVERSITY ASSEMBLY

All students are required to attend the official Assembly, which is usually held on the first and third Wednesdays of each month, at 11:30 A. M.

Special Assemblies may be called from time to time, as the interests of the University demand.

SOCIETIES

The whole body of students and the Faculty are organized in one society entitled the Associated Students of the University of Montana. This society, through committees, manages such general interests as athletics, oratory, debates, entertainments, etc. Its dues are one dollar per year.

Two literary societies, the Hawthorne and Clarkia, are open to students. The first-named society is composed of young men and the second of young women. Students will find membership in either of these societies helpful and pleasant. Meetings are held in John M. Evans Hall, equipped for the use of the societies through the liberality of Mr. Evans and other citizens of Missoula.

Branches of the Y. M. C. A. and the Y. W. C. A. are organized in affiliation with intercollegiate associations, and carry on effective work for the religious life of the University.

Five musical organizations are in existence, the University Glee and Mandolin Clubs, composed of young men, the Music Club and the Sextette, composed of young women, and the University Orchestra. These organizations are in flourishing condition and provide music for University events during the year.

They furnish a good opportunity for all students who have musical talent to cultivate it as well as to participate in the social pleasures pertaining to such organizations.

Fraternities are represented by chapters of Sigma Nu, Sigma Chi, Kappa Kappa Gamma, Kappa Alpha Theta, Iota Nu, and Sigma Tau Gamma.

Two societies in which membership comes only as an unsought honor are Silent Sentinel for men and Penetralia for women. These are non-secret societies, but they do not hold public meetings. Their purpose of unselfishly advancing the interests of the University is mostly attained through personal effort.

A Dramatic Club, a Science Association, and an Engineers' Club, perform functions indicated by their titles.

THE STATE ORATORICAL ASSOCIATION

This association was organized in 1900. The institutions represented are the Montana Wesleyan University, the Montana College of Agriculture and the Mechanical Arts, the Montana Normal College, and the University of Montana. The purpose of the association is to promote interest in oratory. Eleven annual contests have been held.

INTER-STATE ORATORICAL ASSOCIATION

The University is a member of the Inter-State Oratorical Association composed of the Universities of Oregon, Washington and Montana. This year's contest is held at Eugene, Oregon.

PUBLICATIONS BY STUDENTS

A University Press Club with a joint stock membership publishes The Weekly Kaimin as a newspaper, and will issue literary editions from time to time. The paper, through the effective efforts of its corps of editors, has become a permanent factor in the University life.

The Junior Class of each current year issues an annual entitled, "The Sentinel." This book is a valuable record of the activities of each year.

ATHLETICS

A Faculty Committee on Athletics, with the Physical Director as chairman, has general oversight of athletic sports. The details of management are in the hands of the Executive Committee of the Associated Students.

The Gymnasium has an equipment of apparatus and baths. The athletic field, located in the northwest corner of the Cam-

pus, is now in excellent condition. There is a quarter of a mile cinder track, within which are located the baseball diamond and the football field. To the south are the tennis courts.

The Faculty has established the following important regulations:

GENERAL CONTROL.—A Faculty Committee on Athletics with the Physical Director as Chairman, has general oversight and control of athletic sports. The management is in the control of the A. S. U. M.

ATHLETICS AND SCHOLARSHIP.—To be eligible to participate in intercollegiate contests, a student must be satisfactorily carrying work equivalent to twelve credit hours, and must have passed (in the case of those previously enrolled in the University or other collegiate institution) at the end of the last semester he attended in at least twelve credits.

AMATEUR COACHING—The employment of professional coaches for all University teams is prohibited.

GENERAL REGULATIONS.—First—For all games scheduled with institutions in the membership of the Montana Intercollegiate Athletic Association the rules and by-laws of the association must be observed.

Second—Games with institutions not in the Montana Intercollegiate Athletic Association may be scheduled if the institutions concerned enforce rules substantially the same as those of the association.

Third—The University will not countenance athletic games of any sort on Sunday, nor games to be played on Memorial Day.

Fourth—No contracts relating to athletics and other events under the jurisdiction of the A. S. U. M. will be considered binding unless written by or countersigned by the Chairman of the respective committees of the A. S. U. M.

Fifth—The football season must close on or before Thanksgiving Day of each year.

Sixth—No engagement shall be made requiring more than three days consecutive absence, not counting holidays.

In administration of the rule concerning scholarship the Faculty Committee on Athletics has adopted the following rule:

The Committee shall include in the lists to be sent to other institutions two weeks before each game, the names of such men as are shown by the reports of instructors at the time to be carrying at least twelve hours with a reasonable prospect of maintaining a satisfactory standing. Evidence of satisfactorily carrying twelve hours of work is to be furnished by supplementary reports a week before the departure of the team for outside games, or a week before games on home grounds. After the supplementary reports are submitted and four days before the departure of teams, or before games on home grounds, the Committee shall strike from the list of eligible players those who are not at the time satisfactorily carrying twelve hours of work.

The following rules of eligibility of the Montana Intercollegiate Athletic Association are in force:

Sec. 1. No student shall participate in any collegiate contest unless he is a bona fide student satisfactorily carrying work equivalent to

twelve credits in a regular or special course, as defined in the curriculum of his college. A credit is to be considered as one recitation hour or laboratory period of not less than two hours per week for the semester.

Sec. 2. No student who has been in attendance in Montana or elsewhere any part of a preceding semester shall be allowed to participate in any collegiate athletic contest unless he shall have passed at the end of the last semester he attended in at least twelve credits of work: Provided, this does not apply to students who are forced to leave school before the end of any semester through sickness, death in family, or other legitimate reasons, said reasons to be certified by the parent or guardian of such students and by the president of the college; and provided, also, such students have passed in required credits the semester preceding, and are up in their twelve credits at the time of leaving, the president to certify as to the student's standing at the time of leaving.

Sec. 3. No student shall be eligible to represent any institution of this association in any form of athletics who has represented any institution or institutions of collegiate rank for an aggregate of four years unless one of these years he shall have been registered in the preparatory department in which case he may participate five years.

Sec. 4. No student registering after the 15th of October shall be eligible to play in any intercollegiate contest before February 1st, of that collegiate year.

Sec. 5. No student registering later than fifteen days after the opening of the second semester shall take part in any intercollegiate athletic contest held during the remainder of that college year.

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Sec. 1. No person shall be allowed to compete in any athletic contest of this association who is not an amateur.

Sec. 2. An amateur is a person who has never competed for money, or under a false name or has knowingly entered any competition particpated in by any professional, or professionals, or has knowingly competed with any professional, or professionals, for any prize or token, or has at any time taught, pursued or assisted at athletic exercises for money or for any valuable consideration.

ANNUAL INTERSCHOLASTIC MEET

For seven years the University has held annual interscholastic invitation meets for track and field contests on Montana Field. Invitations to participate have been extended to all high schools in the state, except that in 1909 Missoula was entirely neutral ground, when the Missoula County High School assisted the University as host for visiting teams.

In determining and administering rules of eligibility for contestants the University has had the invaluable aid of the Montana State Interscholastic Athletic Association, hereafter to be known as the Montana High School Athletic Association. This is a league of accredited high schools of the state, organized for the promotion and control of athletics.

Usually about twenty schools are represented in the annual contests with from three to twenty contestants from each school.

The University pays railroad fares of five representatives from each school, and furnishes entertainment and medals for the contestants.

To the athletic contests, a contest in declamation is added, with one representative from each school.

Great interest is taken in these contests and their influence in raising standards and unifying the schools by bringing them together in friendly rivalry has been very great.

The meet for 1910 is held May 11, 12, 13, and that for 1911 will be held in the corresponding week.

HIGH SCHOOL DEBATING LEAGUE

A debating league having for its object improvement in debate among students in high schools of the state was organized by high school principals and superintendents at a meeting held at the University on May 17, 1906. Among the provisions of the constitution is one that the president shall be a member of the Faculty of the University. Another is that the final contest shall occur at the University at or before the time of the Interscholastic Meet.

The several series of contests have been held for four years, in 1907, 1908, 1909 and 1910.

THE LIBRARY

The General Library, consisting of about 17,000 volumes and 8,000 pamphlets, occupies the main floor of the Library building.

Reference books, including general encyclopedias, dictionaries, indexes, and special reference works on history, literature, science, etc., are placed on open shelves in the reference room where they are accessible to all. Works selected by professors for supplemental reading in connection with class room work are "reserved" on special shelves for students in those classes.

Admission to the shelves is restricted to the Faculty, administrative officers, the graduate students and members of the senior class; other students may be admitted upon recommendation of their instructors. Students are allowed to withdraw books from the library under reasonable regulations.

The system of departmental libraries prevails to a limited extent, collections of books specially needed in connection with laboratory and class room work being deposited in several departments.

The library receives nearly 200 periodicals, the current numbers of which are available in the reading room, as are newspapers and college exchanges. Through the courtesy of the editors a large number of the daily and county newspapers of Montana are sent to the reading room for the use of students.

The library is a designated depository of documents issued by the United States Government.

The library is open from 8:15 a. m. to 5:30 p. m., and from 7:00 to 9:30 p. m., except on Saturday when the hours are from 9:00 a. m. to 12:30 p. m., and from 1:30 to 5:00 p. m. It is also open, for reading only, on Sundays from 2:30 to 5:00 p. m. Persons not connected with the University are free to use the books.

As a part of the educational system of the state, the University Library is glad to extend all possible assistance to the high schools of the state. Under reasonable regulations, books and pamphlets will be loaned upon request, and where it is impossible to loan material, reference lists or suggestions as to sources of information are gladly given.

Gifts are always gratefully received, and any one who is about to destroy pamphlets or periodicals is reminded that a library can preserve and make useful much that is useless in a household. Material relating to Montana, by Montanans, or published in the State, is particularly solicited; also files of State papers, especially early issues, and early catalogues of the University.

THE MUSEUM

The Museum is located in the large and well-lighted basement of the Library building. Cases made of native woods display the collections to advantage.

A room in the basement of University Hall is used for the storing of collections not on display. Geological and biological material almost completely fills the available shelving. These valuable collections have been partly catalogued, and the larger space now available in the new quarters for the Museum will make possible more extensive exhibits.

The Museum material not stored in the room set apart for the collections is housed in the different departments. Indeed, much of it is indispensable to department work, and as a result much of the Museum is scattered.

Considering the time during which material has been gathered, and the amount expended, the collections have made remarkable growth. The intention is to make the Museum a

depository of material representing the natural, mineral and scientific wealth of the state.

COLLECTIONS

The collections of the Museum, from various sources, are as follows: A collection of over a thousand bird skins, almost entirely from the state; a collection of shells, partly collected in the state, and partly through donations from several sources; a collection of plants, embracing about 3,000 species, with many thousand duplicates, received largely through donations, by collecting and from the exhibit at Omaha; a collection of insects, partly through purchase, but largely by collecting; a collection of fossils, almost entirely from the state, partly donated and for the remainder collected; a collection embracing money, historical relics, souvenirs and promiscuous articles; a collection of fishes, partly from the U. S. Fish Commission, the remainder collected in the state; a collection of fresh water entomostraca from the lakes and rivers of Montana; a collection embracing coals, rocks, concentrate samples, building stones, brick, tile and pottery, developed and produced in the state; a set of the series of educational rocks prepared by the U. S. Geological Survey; the Wiley collection of over a thousand species of Lepidoptera.

It is most earnestly requested that all who are interested in the University, and especially in the preservation of valuable material for scientific work, should take special pains to contribute to the Museum. Time and circumstances are fatal to nearly all specimens, but proper care in the Museum will secure their preservation. Correspondence is solicited concerning material which may be donated. All donations will be acknowledged, and the articles properly labeled and the donor's name recorded.

EDUCATIONAL MUSEUM

There is being built up in connection with the Department of Education in University Hall, an Educational Museum, designed to present illustrative materials of the entire educational field to the students of education in the university and to the teachers of the state. When finally completed it will contain in its several sections, (1) the best school texts in all elementary and secondary school subjects; (2) charts, maps, school supplies and such other illustrative material as may show the application of the newest and most advanced ideas in education and methods; (3) a carefully selected list of the best books on the psychology of learning, on the methods and art of teaching, on the growth and development of children, on educational psychology and the psychology of special methods in the several school branches, on mental and school hygiene, etc.; (4) old text

books and materials illustrating the history and development of methods; (5) a collection of all national, state, and city reports, the published proceedings of educational associations, and societies, copies of school laws of the various countries and states, reports of Boards of Education, educational bulletins, and all general and special books of reference; (6) typical sets of text books used in the German, Scandinavian and French elementary and secondary schools; (7) the catalogues of the leading universities, colleges, normal and technical schools of the world; (8) a complete set of the text books used in Montana schools, and such other materials as may show the progress made by the schools of the state; (9) classified bibliographies for all divisions and aspects of the educational field; (10) the reports and files of special studies of educational problems in the fields of child study, educational psychology, statistics and hygiene; (11) educational journals devoted to the printing of general educational news and results of current investigations of educational problems.

DEPARTMENTS AND COURSES OF INSTRUCTION

In the following statements a "course" extends through one semester. One credit "hour" per week is the equivalent of about three hours of time spent in lectures or recitations and in study. Likewise three hours per week in a laboratory will be reckoned as one credit "hour."

These announcements are subject to necessary changes in details, especially as to days of the week and hours of the day. If less than three qualified students apply for a particular course it may not be given.

LATIN AND GREEK

MAJOR REQUIREMENTS

Students choosing this department for their major work will be required to take at least thirty hours of the work outlined below. Six of these hours must be given to the courses in Greek and Roman life; and at least twelve hours to Latin, the rest of the required hours may be given to Greek.

COURSES IN LATIN

Note.—Courses IA, IB, IIA and IIB are designed especially for first year work, to give a preliminary grammatical review; but students of exceptionally good preparation and aptitude for the work may take other courses first if circumstances require such a departure from the desirable order of work. Students taking Latin as their major subject should, as far as possible, take the courses in the order

presented below; but the courses are open to students in any college year if they are prepared to take the work with profit.

IA. CICERO.—De Amicitia and De Senectute of Cicero.

First semester; 3 credit hours; M. W. F., 9:30.

IB. PROSE COMPOSITION.—

First semester; 2 credit hours; T. Th., 9:30.

IIA. LIVY.—Books XXI and XXII.

Second semester; 3 credit hours; M. W. F., 9:30.

IIB. PROSE COMPOSITION.—

Second semester; 2 credit hours; T. Th., 9:30.

III. CATULLUS, HORACE.—Selected Poems of Catullus and Odes and Epodes of Horace.

First semester; 3 credit hours; M. W. F., 8:30.

IV. TACITUS.—The Agricola and Germania.

Second semester; 3 credit hours; M. W. F., 8:30.

V. HORACE, JUVENAL.—Selected Epistles of Horace and Satires of Horace and Juvenal.

First semester; 3 credit hours; M. W. F., 10:30.

VI. PLAUTUS, TERENCE.—Selected Comedies of Plautus and Terence.

Second semester; 3 credit hours; M. W. F., 10:30.

VII. LUCRETIUS.—Selections from De Natura Rerum.

First semester; 3 credit hours; M. W. F., 11:30.

VIII. PLINY, CICERO.—Selected Letters of Pliny and Cicero.

Second semester; 3 credit hours; M. W. F., 11:30.

IX. ROMAN LIFE.—A view of Roman life such as is presented in "Life of the Greeks and Romans" by Guhl and Koner, and Johnston's "Private Life of the Romans" and similar studies. The work is conducted by reading works of reference, guided by syllabi of lessons, with the aid of informal talks and illustrations by photographs and stereopticon views.

Second semester; 3 credit hours; M. W. F., 1:30.

COURSES IN GREEK

Note.—Greek is begun in the University because few high schools of Montana offer Greek in their courses. Opportunity will be given to take any of the courses for which students are prepared, provided there are at least three applicants.

I. BEGINNING GREEK.—White's First Greek Book.

First semester; 5 credit hours; M. T. W. Th. F., 10:30.

II. BEGINNING GREEK.—Completion of First Greek Book and beginning Xenophon's Anabasis.

Second semester; 5 credit hours; M. T. W. Th. F., 10:30.

III. XENOPHON, PROSE COMPOSITION.—Four books of Anabasis completed, with composition based on the text read.

First semester; 5 credit hours; time to be arranged.

IV. HOMER.—Selections from the Iliad and Odyssey.

Second semester; 5 credit hours; time to be arranged.

V. HERODOTUS, THUCYDIDES.—Selections from Herodotus and Thucydides.

First semester; 3 credit hours; time to be arranged.

VI. PLATO.—Apology and Crito of Plato.

Second semester; 3 credit hours; time to be arranged.

VII. DRAMA.—A play each of Aeschylus and of Sophocles, and selections from Euripides and Aristophanes.

First semester; 3 credit hours; time to be arranged.

VIII. PINDAR, DEMOSTHENES.—Selected Odes of Pindar, Demosthenes on the Crown.

Second semester; 3 credit hours; time to be arranged.

IX. GREEK LIFE.—A course like that in Roman life described above, with Blumner's Home Life of the Ancient Greeks and Guhl and Koner's Life of the Greeks and Romans as the principal works of reference.

First semester; 3 credit hours; M. W. F., 1:30.

ENGLISH AND RHETORIC

MAJOR REQUIREMENTS

Students making this their major department may specialize either in Composition or in the English Language.

Students who make Composition their special field are required to take courses VII, X, XII, and, selecting different forms of composition, to repeat English III and IV in at least four semesters. They should also elect at least four courses in French or German, and as many general courses in history, literature, and science as possible. No student will be allowed to specialize in Composition who does not show conspicuous ability in writing.

Students taking the English Language as their major field are required to take courses VII, VIII, IX, X, and as many courses in literature and language, especially Latin or German, as possible.

Students desiring to secure recommendations as High School teachers of English, must have taken courses III, IV, VII-XII.

COURSES IN COMPOSITION

O. CORRECT ENGLISH.—Drill in spelling, punctuation, and grammar. This course is provided for the assistance of any students deficient in these particulars and will be required of Freshmen whose work in English I and II shows its necessity.

Second semester; no credits; Th., 9:30.

I and II. FRESHMAN ENGLISH.—Training in oral and written composition with outside illustrative reading and required quotations.

Required of all Freshmen. No credit is given for English I alone. Students deficient in spelling, punctuation or grammar will be required to take English O.

Both semesters; 2 credit hours; 3 recitations in two sections, M. W. F. and T. W. F., 10:30.

III and IV. ADVANCED COMPOSITION.—Journalism, letters, short stories or description.

Both semesters; 2 credit hours; W., 1:30, and individual conferences.

V. FORMS OF PUBLIC ADDRESS.—Editorials, orations, debates.

First semester; 3 credit hours; M. Th. F., 11:30.

COURSES IN ENGLISH LANGUAGE

VII. SYNONYMS AND USAGES.—With a special study of English vocabulary and papers on subjects of interest in the study of language.

First semester; 3 credit hours. Omitted in 1910-11.

VIII. CHAUCER.—Selections from the Canterbury Tales, studied with special attention to the language.

Second semester; 3 credit hours; M. W. F., 9:30.

IX. HISTORY OF THE ENGLISH LANGUAGE AND ANGLO SAXON LITERATURE.

First semester; 3 credit hours. Omitted in 1910-11.

COURSES IN APPLIED RHETORIC

X. ENGLISH PROSE.—A study of the sentence, the paragraph, the general principles of rhetoric and the qualities of style, as illustrated in modern English prose.

Second semester; 3 credit hours. Omitted in 1910-11.

XI. ENGLISH VERSE.—Principles, forms and technic.

First semester; 3 credit hours; M. W. F., 9:30.

XII. PRINCIPLES OF CRITICISM.—Illustrated in typical masterpieces.

Second semester; 3 credit hours. Omitted in 1910-11.

XIII. TYPES OF DRAMA.

First semester; 3 credit hours. Omitted in 1910-11.

XIV. THE SHORT STORY.—Its varieties and principles.

Second semester; 2 credit hours; M. Th., 11:30.

LITERATURE

MAJOR REQUIREMENTS

Students whose major is Literature are required to take thirty hours, and are permitted to take forty hours in the department. They are also expected to take four courses in French or German, two courses in History, and one course in English.

COURSES OF INSTRUCTION

Note.—Composition I and II are prerequisite to the work in this department. Literature II is prerequisite to all other courses in this department. From English VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, one course is required, and three courses may be accepted as Literature. Course VI must be preceded by Course V. Courses VI, X, XI and XII are for advanced students.

I. ENGLISH LITERATURE.—History and development of English Literature in outline. Open to all students.

First semester; 2 credit hours; T. Th., 1:30.

II. ENGLISH LITERATURE.—Elementary work in the essay, poetry, drama, and fiction. Open to all students.

Second semester; 2 credit hours; M. Th., 10:30.

III. ENGLISH LITERATURE OF THE ELIZABETHAN PERIOD.—Spenser, Marlowe, and Bacon. Open to all students.

First semester; 2 credit hours. Omitted in 1910-11.

V. ENGLISH LITERATURE, SHAKESPEARE.—Introductory course. All of Shakespeare's plays are read in chronological order. Open to all students in the second, third and fourth years.

First semester; 3 credit hours; M. W. F., 11:30.

VI. ENGLISH LITERATURE, SHAKESPEARE. — Advanced course. A careful and detailed study of five of Shakespeare's plays; for 1910-11, "Antony and Cleopatra," "Hamlet," "Cymbeline," "The Tempest," "As You Like It." Open to all students who have completed Course V.

Second semester; 3 credit hours; M. W. F., 11:30.

VII. ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY.—Lectures and written reports. Special attention is given to Pope, Goldsmith, Gray, Addison, and Swift. Open to all students.

First semester; 2 credit hours; T. F., 11:30.

VIII. ENGLISH LITERATURE OF THE NINETEENTH CENTURY, PROSE.——Carlyle, Ruskin, Eliot. Open to all students.

Second semester; 3 credit hours. Omitted in 1910-11.

IX. ENGLISH LITERATURE, THE NOVEL.

First semester; 3 credit hours. Omitted in 1910-11.

X. ENGLISH LITERATURE.—Wordsworth, Coleridge, Byron, Shelley, and Keats are studied in representative selections. Open to advanced students.

Second semester; 2 credit hours; T. Th., 8:30.

XI. ENGLISH LITERATURE.—Course X continued.

First semester; 3 credit hours; M. W. F., 8:30.

XII. ENGLISH LITERATURE, TENNYSON AND BROWNING. —The critical study of selections from Tennyson and Browning. Open to advanced students.

Second semester; 3 credit hours; M. W. F., 9:30.

XIII. AMERICAN LITERATURE.—A survey of American literary history, and the discussion of notable works in prose. Open to all students.

First semester; 3 credit hours; M. W. F., 10:30.

XIV. AMERICAN LITERATURE.—Selections from the verse of American poets. Open to all students.

Second semester; 2 credit hours; T. Th., 1:30.

XV. GRADUATE COURSE.—Selected topic for intensive study.

First semester; credit and time to be arranged.

XVI. GRADUATE COURSE.—Selected topic for intensive study.

Second semester; credit and time to be arranged.

PUBLIC SPEAKING

This department combines the study of the best literature with the art of interpretation and expression. It aims to give the student control of his own powers and to give him easy, simple and effective delivery.

I. ELEMENTS OF PRACTICAL ELOCUTION.—Voice building; enunciation; pronunciation; analysis and interpretation; reading; recitals.

First semester; 2 credit hours; T. Th., 8:30.

II. ELEMENTS OF PRACTICAL ELOCUTION.—A continuation of course I.

Second semester; 2 credit hours; T. Th., 8:30.

III. ORATORY.—History of American Oratory; analysis and interpretation; orations read and delivered; extemporaneous speaking.

First semester; 2 credit hours; W. F., 11:30.

IV. ORATORY.—A continuation of course III.

Second semester; 2 credit hours; W. F., 11:30.

V. ADVANCED INTERPRETATION.—Reading of a standard play; expressive reading; recitals.

First semester; 2 credit hours; T. Th., 9:30.

VI. ADVANCED INTERPRETATION.—Expressive reading from Shakespeare, Browning, Tennyson, Longfellow, Aldrich, Kipling and others; elements of criticism; recitals.

Second semester; 2 credit hours; T. Th., 9:30.

MODERN LANGUAGES

MAJOR REQUIREMENTS

A student electing Modern Languages as a major will be required to take two years at least of one modern language beyond the first year course; two years at least of one other modern language; one year History, preferably the history of Europe; one course in elementary philology.

COURSES IN GERMAN

Note.—No beginning class will be organized in the second semester.

I and II. ELEMENTARY.—Joyne's Meissner's or Becker's German Grammar or their equivalents. Bernhart's composition. Translation of easy prose and poetry. Careful and systematic attention must be paid to pronunciation. Readers are chosen from the following: Kleine Geschichten, Maerchen und Erzahlungen, Der Zerbrochene Krug, Immensee.

Both semesters; 5 credit hours; M. T. W. Th. F., 8:30.

III and IV. INTERMEDIATE.—Composition, conversation and some of the following readers: Wilhelm Tell, Karl Heinrich, Das Abenteuer einer Neujahrsnacht, Maria Stuart, Minna von Barnhelm, Hermann und Dorothea, Wallenstein.

Both semesters; 3 credit hours; M. W. F., 10:30.

V and VI. ADVANCED.—Composition, conversation, sight reading: Max Mueller, Deutsche Liebe, Scheffel, Ekkehart, Goethe, Faust, etc. Students electing Chemistry, Geology or some other science as their major work will do outside reading upon articles which bear upon their special work.

Both semesters; 3 credit hours; M. W. F., 1:30.

VII and VIII. SPECIAL.—Sight reading and conversation, with outside reading, either scientific or purely literary.

Both semesters; 1 credit hour; time to be arranged.

COURSES IN FRENCH

Note.—No beginning classes will be organized in the second semester.

I and II. ELEMENTARY.—Devoted to the study of Chardenal, Frazier and Squair, Aldrich and Foster's Grammar, or their equivalents. Readers: Trois Contes Modernes, Rollin's Reader, La Tulipe Noire, L'Abbe Constantin, etc.

Both semesters; 5 credit hours; M. T. W. Th. F., 9:30.

III and IV. INTERMEDIATE.—Readers: Trois Mousquetaires, Quatre-vingt Treize, Pecheur d'Islande, etc. Conversation and composition.

Both semesters; 3 credit hours; M. W. F., 11:30.

V and VI. ADVANCED.—Duval's Histoire de la Literature francaise, Les Miserables, Notre Dame de Paris, etc. Conversation and composition.

Both semesters; 3 credit hours; M. W. F., 2:30.

VII and VIII. SPECIAL.—Sight reading and conversation with outside reading.

Both semesters; 1 credit hour; time to be arranged.

COURSES IN SPANISH

I and II. ELEMENTARY.—Ramsey, Spanish Grammar. Readers: Matzke, Gil Blas de Santillana, and composition.

Both semesters; 3 credit hours; M. W. F., 3:30.

III and IV. INTERMEDIATE.—Dona Perfecta, Ford's Spanish Composition, Don Quixote, conversation.

Both semesters; 3 credit hours; time to be arranged.

PHILOSOPHY AND EDUCATION

MAJOR REQUIREMENTS

For students who take their major work in Philosophy the required work consists of courses I and II, XIII (or XVII), XIV, III and IV, V and VI (or XV and XVI, or VII and VIII), and IX (or X). Students who desire to give their chief attention to Philosophy should elect courses XV and XVI and substitute courses in Philosophy for courses IX and X. Those who wish to secure the teacher's certificate must take courses I and II in Philosophy in their Sophomore year.

Students preparing for the profession of teaching or desiring to make Education a major are required to take sixteen hours in the subject, preferably courses I and II, III and IV, V and VI, and eight additional hours elected by the student under the advice of the head of the department.

COURSES IN PSYCHOLOGY AND PHILOSOPHY

Note.—No courses in these subjects are open to Freshmen at the beginning of the year, but they may be admitted to course XIV. However, election of work in these subjects should be deferred until the second year or later.

I and II. ELEMENTARY PSYCHOLOGY.—A general course, serving as an introduction to all special courses in Psychology and as a foundation course for work in Philosophy and Education. Lectures, experimental demonstrations and readings from standard text-books. Prerequisite: One year of University work.

Both semesters; 3 credit hours; M. W. F., 9:30.

III and IV. LABORATORY COURSE IN EXPERIMENTAL PSYCHOLOGY.—Typical experiments in sensation, perception, attention, association, memory, movement, affective expression, imagery, fatigue, etc., selected and arranged to familiarize students with the methods, apparatus, and results of typical experiments. Prerequisite: May be taken with or in sequence to courses I and II.

Both semesters; 2 credit hours; T. Th., 9:30.

V and VI. SYSTEMATIC PSYCHOLOGY.—A comparative study of two or more standard treatises and of current psychological literature. Prerequisite: Six hours of Psychology. Alternates with courses VII, VIII and IX, X.

Both semesters; 3 credit hours; M. W. F., 10:30. Omitted in 1910-11.

VII and VIII. GENETIC PSYCHOLOGY.—A study of the origin and development of consciousness. In the first semester the development of intelligence in the animal series will be traced. In the second

semester the course of mental development in the child from birth to adolescence will be taken up. Prerequisite: Philosophy I and II.

Both semesters; 3 credit hours; given every third year.

IX. ABNORMAL PSYCHOLOGY.—A study of suggestion, hypnotism, duplex personality and the pathology of mind. Text-book, collateral reading and lectures, with clinics. Prerequisite: Six hours of Psychology.

First semester; 3 credit hours; given every third year. Omitted in 1910-11.

X. SOCIAL AND APPLIED PSYCHOLOGY.—An introductory study of the psychic factors and forces behind material and social progress. The application of Psychology to business, medicine and law. Selected readings from Baldwin, Tard and Ross. Lectures and reports. Prerequisite: Six hours of Psychology.

Second semester; 3 credit hours; given every third year. Omitted in 1910-11.

XI and XII. PSYCHOLOGICAL SEMINARY.—Study and discussion of a subject selected for study at the beginning of each semester. In 1909-10 the Psychology of Learning was taken up. Prerequisite: Philosophy I and II. Open to those whose major subject is Philosophy or Education.

Both semesters; 1 or 2 credit hours; F., 4:00.

XIII. LOGIC.—Recitations, lectures and exercises in logical analysis. Forms and expression of arguments; the detection of fallacies; some discussion of scientific method. Text, Creighton's "Introductory Logic." Prerequisite: One year of university work.

First semester; 2 credit hours; T. Th., 8:30. Alternates with courses XVII and XVIII.

XIV. ETHICS.—Lectures and assigned readings. Prerequisite: One year of university work.

Second semester; 2 credit hours; T. Th., 8:30.

XV and XVI. HISTORY OF PHILOSOPHY.—A rapid survey of the development of thought from the time of the earliest Greek philosophers to the present time. Rogers, "Student History of Philosophy," serves as a general guide to the course. Prerequisite: Whenever possible, preceded by courses I and II, and XIII (or XIV or XVII).

Both semesters; 3 credit hours; M. W. F., 8:30.

XVII. INTRODUCTION TO PHILOSOPHY.—An outline survey of the field of philosophy with a study of fundamental problems and tendencies. Texts, Hibben's "Problems of Philosophy" and Paulsen's "Introduction." Prerequisite: One year of university work.

First semester; 2 credit hours; T. Th., 8:30.

XVIII. THOUGHT MOVEMENTS OF THE NINETEENTH CENTURY.—A non-technical course taking up the origin and development of the literary and popular thought movements of the century. Intended for students of history and literature as much as for special students of philosophy. Prerequisite: One year of university work.

Second semester; 2 credit hours. Alternates with courses XIII and XVII. Omitted in 1910-'11.

COURSES IN EDUCATION

Note.—The courses in Education are intended primarily for junior, senior and graduate students, but are open to other students sufficiently mature and qualified to pursue the work with profit. Courses I and II in Philosophy or their equivalents are prerequisite to all work in Education and should be pursued during the sophomore year.

A University Certificate of Qualification to Teach will be given to students who secure the requisite academic and pedagogic training. [See statement, page 33.]

To supplement the laboratory and educational library and to assist special students of education an Educational Museum is being established in University Hall.

I and II. PRINCIPLES OF EDUCATION.—The meaning of education considered from the standpoints of psychology, neurology, biology, anthropology and sociology. The work of the first semester will include a consideration of the leading educational ideals held by the various cultural nations. In the second semester educational problems and processes will be considered from the standpoint of psychology and neurology.

Both semesters; 3 credit hours; M. W. F., 11:30. Alternates with courses III and IV. Omitted in 1910-11.

III and IV. HISTORY OF EDUCATION.—In this course the development of educational ideals and practices in their relation to the history of civilization will be traced. In the first semester the physical, moral and intellectual development of the earliest cultural nations will be treated. In the second semester the modern period will be taken up, including education in America. Text book, Monroe's History of Education.

Both semesters; 3 credit hours; M. W. F., 11:30. Alternates with courses I and II.

V. SCHOOL HYGIENE.—The hygienic aspects of school architecture and equipment and the more important aspects of mental hygiene and the hygiene of instruction will be considered, including such topics as habits of study and teaching, hygiene of various school subjects, etc.

First semester; 2 credit hours; time to be arranged.

VI. HISTORY AND SCIENCE OF METHOD.—The work of this course will include (1) a historical survey of the arts of teaching and study; (2) a consideration of present day methods and principles of teaching. Chief attention will be given to the psychology of learning, instead of methods of teaching the various school subjects.

Second semester; 2 credit hours; T. Th., 11:30.

VII. SCHOOL SUPERVISION.—A study of practical problems in elementary and secondary education, the organization and management of schools, courses of study, electives, correlation of studies, promotions, discipline, teachers' meetings, etc. Visits to different schools will be made and observation and practice teaching provided to a limited extent.

First semester; 3 credit hours; M. W. F., 8:30.

VIII. HIGH SCHOOL PEDAGOGY.—A practical consideration of the problems of the high school, the place of the high school in an

educational system, its relation to the higher and lower schools. It includes the psychology of adolescence, and the development of youth as related to such problems of secondary education as attendance, interest, discipline, ideals, formation of character, etc. To give perspective, the historical development of the American high school will be treated, and a comparative study of foreign school systems will be made.

Second semester; 3 credit hours; M. W. F., 8:30.

IX and X. PEDAGOGICAL SEMINARY.—Designed for special students of education. Members meet once a week for discussion of a general topic announced at the beginning of each semester. For 1909-10 the topic was Experimental Pedagogy. A part of the time will be given to a critical consideration of current technical educational literature.

Both semesters; 1 or 2 credit hours; M., 4:00

HISTORY AND ECONOMICS

MAJOR REQUIREMENTS

For the present courses in both History and Economics may be counted as one major. Students may, however, elect either subject with the expectation that sufficient work will hereafter be offered for the completion of a major.

COURSES IN HISTORY

I. EUROPEAN HISTORY.—The disintegration of the Roman Empire; the Germanic settlement; the German contribution to modern institutions; the development of political, social and economic institutions; the church; the beginnings of modern nationality; the Renaissance; the Reformation.

First semester; 3 credit hours; M. T. Th., 11:30.

II. EUROPEAN HISTORY.—The economic and political evolution of the modern European states from the time of Louis XIV to the present; the ecclesiastical wars; the causes and consequences of the revolutionary movements; national unity; the growth of democracy in the nineteenth century.

Second semester; 3 credit hours; M. T. Th., 11:30.

III. ENGLISH HISTORY.—The development of the economic and political organization of the English people from the early time to the period of the Tudors; racial composition; social history.

First semester; 3 credit hours; M. W. F., 1:30.

IV. ENGLISH HISTORY.—The modern development of constitutional ideas; the revolutions of the seventeenth century and of the eighteenth century; the industrial revolution; the development of democracy in the nineteenth century.

Second semester; 3 credit hours; M. W. F., 1:30.

V. AMERICAN HISTORY.—The sources of the American constitution; its establishment, the organization of the government; early political movements; the interpretation of the constitution.

First semester; 3 credit hours; M. W. F., 9:30.

VI. AMERICAN HISTORY.—The development of the constitution from the time of the election of Andrew Jackson; the origins and history of the later parties; the settlement of the questions of nationality. Lectures by President Duniway.

Second semester; 3 credit hours; M. W. F., 9:30.

VII and VIII. AMERICAN HISTORY—SEMINAR.—The materials and methods of historical research; investigation of selected problems. Open to students properly qualified for advanced studies in history. Conducted by President Duniway.

First and second semesters; 2 credit hours; T. Th., 11:30.

COURSES IN ECONOMICS

I. ECONOMIC HISTORY.—An historical analysis of industry and property. The development of the modern industrial organization; the industrial revolution; industrial history of the United States with a view to the understanding of current economic questions.

First semester; 3 credit hours; M. W. F., 8:30.

II. ECONOMICS.—The processes of the production and the distribution of wealth; the laws of profits, interest, rent and wages; illustrations of economic principles from current economic life.

Second semester; 3 credit hours; M. W. F., 8:30.

III. MONEY AND BANKING.—The nature and the functions of money; history and present organization of the American monetary system; the theory of credit; history and description of the American banking system; banking methods; the conditions of a sound currency system; present financial problems.

First semester; 2 credit hours. Omitted in 1910-11.

IV. PUBLIC FINANCE.—The theory of finance; public expenditures; sources of revenue; systems of taxation; problems of taxation; financial administration and policy.

Second semester; 2 credit hours; T. Th., 8:30.

V. BUSINESS ORGANIZATION.—Financial institutions, savings banks, trust companies, building associations, insurance, etc.; corporations, organization and problems, as capitalization, bonding, reserves, monopoly; stock exchanges, brokerage, speculation; legislation and reform; investments.

First semester; 2 credit hours; T. Th., 10:30.

VI. BUSINESS ADMINISTRATION.—Character and administration of typical business activities, as manufactures, agricultural economics, transportation; advertising; credits, collections; the economic and financial organization of the state of Montana.

Second semester; 2 credit hours; T. Th., 10:30.

VII and VIII. SOCIOLOGY.—A study of the development of the social spirit and of the social reason, in four parts (1) primitive society and fundamental social forces; (2) the development of civilization and of democracy; (3) social psychology and the conflict of ideals with institutions; (4) social policy and the principles of orderly progress. Prerequisite: One year in History and Economics.

Both semesters; 3 credit hours; M. W. F., 10:30.

IX and X. SOCIAL PROBLEMS.—An application of the principles of economics and sociology to the study of current questions and insti-

tutions; theories and institutions for the betterment of economic and social organization, individualism, socialism, corporations and labor unions, philanthropy and the church; social education; the law and industry and the law and property; constructive philanthropy. Prerequisite: One year in Economics and Sociology.

Both semesters; 2 credit hours; T. Th., 9:30.

XI and XII. SEMINAR.—Studies in selected topics, and the discussion of individual researches.

Both semesters; 2 credit hours; T. Th., 1:30.

LIBRARY SCIENCE

SPECIAL CHARACTER OF COURSES

It is the purpose of the Library to offer instruction to students who wish to specialize in library work. This work will include the fundamental principles of library economy, and the essentials of library technique and practice, so that students will have no difficulty in undertaking the requirements of assistants' positions in any library.

The work will last throughout one semester and requires the entire time of the student. Instruction will be given by lectures, followed by practical work under the supervision of the librarians in the University Library and the Missoula Public Library. The student will thus have experience in both types of libraries.

The entrance requirements for this department are the same as those for others in the University. Students will be admitted at the beginning of the first semester. The number of students at any one time will be limited to four. It is therefore advisable that applications for admission be made before the opening of the University in the fall.

Certificates will be granted to students who satisfactorily complete the course.

COURSES IN INSTRUCTION

I. LIBRARY ECONOMY.—Instruction will be given in the order of regular library routine and includes the subjects of trade bibliography, ordering, accession, classification, cataloguing and binding. One month is devoted to cataloguing books for the University Library.

III. ELEMENTARY REFERENCE.—This course trains students in methods of research and familiarizes them with indexes, dictionaries, encyclopedias, atlases and handbooks of general information. They have practical work in preparing reference lists for special classes, literary societies and debates.

V. SELECTION OF BOOKS.—Lectures on the various editions of the works of standard authors; the type, paper, and binding used by the more noted publishers; the placing of orders through various publishers or agents; second-hand book sellers and auction and remainder sales.

VII. BIBLIOGRAPHY.—Lectures by professors from the various departments on the best collections of books for general readers.

IX. PUBLIC DOCUMENTS.—A brief study of the activity of the government in publication, the methods of printing and distributing the federal documents, and a study of the check lists and the various indexes.

FINE ARTS

MAJOR REQUIREMENTS

For major work in this department students may take from thirty to forty hours. Ten of these hours may be selected from the departments of Literature, History, Languages and Philosophy.

COURSES IN HISTORY AND APPRECIATION

I. HISTORY OF ANCIENT ART.—This course gives a general survey of the architecture, sculpture and painting of the ancient world.

First semester; 3 credit hours; time to be arranged.

II. HISTORY OF GREEK SCULPTURE.—A study of the development of Greek sculpture, the major consideration being the work of the fifth and fourth centuries.

Second semester; 3 credit hours; time to be arranged.

III. HISTORY OF RENAISSANCE PAINTING.—A study and comparison of the Florentine, Venetian, Flemish and Dutch schools of painting.

First semester; 3 credit hours; time to be arranged.

IV. ARCHITECTURAL STYLES.—An analysis of the styles of architecture, with special emphasis upon the evolution of church structure from the early basilica to the developed Gothic style.

Second semester; 3 credit hours; time to be arranged.

V. THE APPRECIATION OF ART.—An introductory course in art criticism, in which an appreciation of aesthetic and technical qualities in the fine arts is acquired by means of lectures on theory, observation, and practical application. This course will consist of two lectures and one laboratory period a week.

First semester; 3 credit hours; time to be arranged.

VI. HISTORY OF MODERN PAINTING.—A consideration of the classic, romantic, realistic and idealistic tendencies of the art of painting in the present age. This includes a study of American painting.

Second semester; 3 credit hours; time to be arranged.

VII. EGYPTIAN ART.—A study of all forms of Egyption art based on the most recent discoveries.

First semester; 3 credit hours. Omitted in 1910-11.

VIII. GREEK VASE PAINTING.—A course in black figured and red figured pottery.

Second semester; 3 credit hours. Omitted in 1910-11.

IX. HISTORY OF MEDIAEVAL, RENAISSANCE AND MODERN SCULPTURE.—A study of the development of the art of sculpture since ancient times, with special consideration of American sculpture.

First semester; 3 credit hours. Omitted in 1910-11.

X. HISTORY OF FLORENTINE PAINTING.—An intensive study of the Florentine school with a view of developing critical and appreciative powers of observation.

Second semester; 3 credit hours. Omitted in 1910-11.

XI. HISTORY OF VENETIAN PAINTING.—A course similar to course X.

First semester; 3 credit hours. Omitted in 1910-11.

XII. HISTORY OF DUTCH AND FLEMISH PAINTING.—A course similar to course X.

Second semester; 3 credit hours. Omitted in 1910-11.

COURSES IN DRAWING, PAINTING AND DESIGN

XIII. ELEMENTARY DRAWING AND PAINTING.—A course in free-hand drawing and painting intended for engineers and teachers.

First semester; 2 credit hours; time to be arranged.

XIV. PRACTICE IN DESIGN.—The essential principles of design. Prerequisite: Course V.

Second semester; 2 credit hours; time to be arranged.

XV. APPLIED DESIGN.—Applications in metal and leather. Prerequisite: Courses V and XIV.

First semester; 2 credit hours. Omitted in 1910-11.

XVI. TECHNICAL TRAINING IN REPRESENTATION.—Practical work in black and white and color. Prerequisite: Course V.

Second semester; 2 credit hours. Omitted in 1910-11.

MUSIC

The Department of Music offers instruction in vocal and instrumental music, and opportunities for study in chorus work.

A principal feature of the department is the Piano School. The Junior and Preparatory Course consists of elementary technical work by Landow, Aloys, Schmidt and others, and interpretative work by Bertini, Czerny, Heller, Reinecke, Gurlitt and others, all scales in octavo position, and all arpeggio of the common chord. The more advanced students take the arpeggio of the Dominant and Diminished Sevenths and more difficult interpretative work. The Senior or Upper School study scales in Thirds, Tenths and Sixths, Cramer's Studies, Clementi's Gradus ad Parnassum; and, when sufficiently advanced, studies by Moscheles, Henselt and Chopin, and interpretative work on concertos, sonatas, etc., by any of the great masters.

In the Violin Department the Sevcik Method is used, also

studies by Kreutzer, Spohr, etc. Advanced Harmony, Counterpoint and Composition may be taught when desired.

Recitals are given by the department at various times during the year, and it also furnishes music for the various college functions, the Interscholastic Meet, etc.

The Glee Club, Sextette and University Orchestra offer opportunities for careful vocal and instrumental training and experience.

By resolution of the Faculty a total of eight credits may be allowed for Music, which is now a free elective. No credits will be allowed for any preparatory work. In Piano Technic everything is preparatory up to and including Czerny's Velocity Studies and Heller's op. 47, or their equivalents, and in Violin Hermann's and Dancha's Studies.

GENERAL CULTURE COURSES

I and II. HISTORY AND GENERAL PRINCIPLES.—Open to all students.

Both semesters; 1 credit hour; T., 1:30.

III and IV. FORM AND COMPOSITION.—Open only to those properly qualified.

Both semesters; 1 credit hour; F., 1:30.

FEES

Piano, one lesson a week	$20 per semester
Violin, one less a week	$20 per semester
If paid monthly	$5 per month

PHYSICAL CULTURE

All students are examined upon their admission to the University, with reference to their health and physical development, and appropriate exercises are prescribed. These exercises are conducted in classes, so far as practicable. To those found unable to take the class work, exercises adapted to individual needs are prescribed.

Physical Culture is required of all undergraduate students during the first two years of their attendance at the University. This work is given upon two days of each week throughout the year, and one-half hour credit is allowed for each semester's work.

The expenses for each student are about five dollars for a regulation suit.

The Department of Physical Culture has supervision over all gymnastic and athletic activities.

COURSES FOR MEN

I and II, III and IV. Exercises without apparatus; the developing appliances; dumb bells; bar bells and Indian clubs; exercises on the rings, horizontal bars, buck, and horizontal ladder. Prescribed to all undergraduate men during the first two years of their attendance at the University.

Both semesters; ½ credit hour; M. W., 4:00.

COURSES FOR WOMEN

V and VI. Exercises without apparatus; breathing exercises, walking, running, and mat exercises. Prescribed to all undergraduate women during the first year of their attendance at the University.

Both semesters; ½ credit hour; two sections; M. W., 1:30 and 2:30.

VII and VIII. Exercises with chest weights; stall bars; dumb bells; bar bells; Indian clubs. Recreative exercises. Prescribed to all undergraduate women during the second year of their attendance at the University.

Both semesters; ½ credit hour; two sections; T. Th., 1:30 and 2:30.

MATHEMATICS

MAJOR REQUIREMENTS

The requirements for a major in Mathematics are thirty-six semester hours, as a minimum, selected as follows: Courses I to VI inclusive, and at least ten semester hours from the remaining courses. Major students in Mathematics who intend to teach the subject will be required to take course X, and also courses I and II in Physics.

COURSES OF INSTRUCTION

Note.—Course I b and courses II, III and IV present a continuous development of the subject matter which is generally given in distinct courses under the various names of algebra, analytic geometry, differential and integral calculus. The traditional division of mathematics into distinct subjects is disregarded and the principles of each subject are introduced as needed and the subjects developed together.

I a. MATHEMATICS (Trigonometry).—The work in Trigonometry covers the following subjects: Definitions of the trigonometric functions as ratios; their line representations; their graphical representations; proof of the principal formulas; trigonometric transformations; circular measure of angles; inverse trigonometric functions; proofs of formulas of right and oblique triangles; theory and use of logarithms; areas and solutions of right and oblique triangles. This course is fully illustrated by practical problems.

First semester; 3 credit hours; M. W. F., 8:30.

1 b. MATHEMATICS (Algebra, Elements of Analytic Geometry and Calculus).—An elementary treatment of methods of elimination, including the principal theorems of determinants; graphical representation of functions with applications to statistical and scientific data; algebraic polynominals including the geometry of the straight line and

some of the more important theorems of the theory of equations; differentiation of the polynomial in one variable, including problems on tangents, normals, maxima and minima, and points of inflection.

First semester; 2 credit hours; T. Th., 8:30.

II a. GENERAL COURSE.—Graphic Algebra with applications and introduction to Modern Geometry. Prerequisite: Entrance mathematics.

Second semester; 3 credit hours; M. W. F., 10:30.

II b. MATHEMATICS (Plane Analytic Geometry, Elements of Calculus).—This course is a continuation of course I. It covers the following subjects: Graphs of algebraic functions involving surds of fractions; the derivation of the equations of curves defined by geometric properties; intersection of curves; differentiation of algebraic functions with applications to geometrical and physical problems; inverse differentiation applied to problems; change of co-ordinate axes; the analytic geometry of curves of the second degree; graphs and derivations of elementary transcendental functions with applications; polar co-ordinates; and curvature.

Second semester; 5 credit hours; M. T. W. Th. F., 8:30.

III. MATHEMATICS (Integral Calculus).—This course covers the following subjects: Elementary formulas of integration; definite integral; integration a process of summation; Taylor's and Maclaurin's series; geometrical applications to areas and lengths of plane curves, volumes of solids of revolution, and other volumes which can be found by a single integration; mechanical applications to work, attraction, pressure and centers of gravity and pressure; integration of simple differential equations.

First semester; 5 credit hours; M. T. W. Th. F., 8:30.

IV. MATHEMATICS (Solid Analytic Geometry, Calculus, Differential Equations.)—This course is a continuation of course III. It covers the following subjects: Elements of solid analytic geometry including a discussion of the plane, the straight line and the surface; partial differentiation; multiple integration with geometrical applications to areas and volumes, and with mechanical application to attraction, moments of inertia and centers of gravity; line integrals and exact differentials, infinite series including a brief treatment of Fourier's series and indeterminate forms, and differential equations.

Second semester; 3 credit hours; M. W. F., 8:30.

V. ANALYTIC MECHANICS.—Rectilinear motion of a particle; curvilinear motion; motion of a rigid body; translation of a rigid body; work and energy; impulse and momentum. Prerequisite: Course III, and course I in Physics.

First semester; 3 credit hours; M. W. F., 10:30.

VI. ANALYTIC MECHANICS—Equivalence of force systems; center of gravity and centroids; attraction and stress; general principles of equilibrium.

Second semester; 3 credit hours; M. W. F., 10:30.

VII. DIFFERENTIAL EQUATIONS.—Differential equations of the first order; linear differential equations; special forms of partial differential equations; and application to problems in geometry, mechanics and physics.

First semester; 2 credit hours; T. Th., 10:30.

VIII. SPHERICAL TRIGONOMETRY.—The development of the formulas of spherical trigonometry, the solution of spherical triangles, problems in spherical mensuration.

Second semester; 2 credit hours. Omitted in 1910-11.

IX. SOLID ANALYTIC GEOMETRY AND DETERMINANTS.—After developing the theory of determinants, use of the same is made in simplifying results in the solid analytic geometry. Prerequisite: Course III.

First semester; 3 credit hours. Omitted in 1910-11.

X. THEORY OF EQUATIONS.—A continuation of the theory of equations given in courses I and II, including symmetric functions of roots, properties of derived functions, methods of elimination and transformation. Prerequisite: Course II.

Second semester; 2 credit hours; T. Th., 9:30.

XI. THEORY OF NUMBERS.—An introductory course covering the elementary properties of numbers, linear congreances, quadratic residues, and quadratic forms.

First semester; 2 credit hours; T. Th., 9:30.

XII. TEACHERS' COURSE.—A critical review of secondary Mathematics; discussion of current developments in methods of teaching and subject matter taught; comparative study of leading textbooks; correlation of mathematics with allied subjects; laboratory mathematics. Prerequisite: Course IV.

Second semester; 3 credit hours; M. W. F., 2:30.

XIII. DESCRIPTIVE ASTRONOMY.—An introductory course, dealing with the fundamental facts, and principal theories of the subject.

First semester; 3 credit hours; M. W. F., 1:30.

XIV. ASTRONOMY.—A short course for engineers. Determination of latitude, azimuth, and time are essential parts of the course, and emphasis is laid on those methods which the engineer will be able to use with the surveyor's transit. The necessary spherical trigonometry is given as needed.

Second semester; 2 credit hours; T. Th., 1:30.

XV. METHOD OF LEAST SQUARES AND THE PRECISION OF MEASUREMENTS.—A discussion of the nature and methods of elimination of errors, adjustment of observations, the determination of the precision measure of results and the discussion of the accuracy necessary to be attained in the component measurements of a series in order that the final result may be secured with a prescribed degree of accuracy. Graphical methods of treating observations, empirical equations. Designed for students in engineering and physics. Prerequisite: Course III.

First semester; 2 credit hours. Omitted in 1910-11.

XVI. ADVANCED INTEGRAL CALCULUS.—Including definite integrals, elliptic integrals, introduction to Fourier's Series with application to geometry, mechanics and physics. Prerequisite: Course IV.

Second semester; 3 credit hours; M. W. F., 9:30.

XVII. MODERN ANALYTIC GEOMETRY.—Trilinear coordinates, duality, harmonic and anharmonic properties, projective properties, theory of correspondence, etc. Prerequisite: Course III.

First semester; 3 credit hours; M. W. F., 9:30.

XVIII. DIFFERENTIAL EQUATIONS.—A continuation of course VI, emphasis being placed on partial differential equations with applications to geometry and physics.

Second semester; 3 credit hours. Omitted in 1910-11.

XIX. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.—An introductory course. Geometrical representation of complex quantities, conformal representation, etc. The methods of Cauchy and Riemann are followed.

First semester; 3 credit hours; M. W. F., 9:30.

GRADUATE COURSES

Opportunity will be given graduate students in Mathematics and Engineering and others who are prepared for the work to select from the following courses: Fourier's Series and Spherical Harmonics, Vector Analysis, Theory of Potential, Advanced Course in Functions of a Complex Variable, Elliptic Functions.

BIOLOGY AND FORESTRY

MAJOR REQUIREMENTS IN BIOLOGY

Those doing major work in Biology will be required to complete one year of Chemistry and two years of Modern Languages. The Biological subjects will include courses I and II in General Biology, III and IV in Zoology, a year in Botany, and additional courses to make not less than a minimum of thirty hours. Seniors in Biology and Botany will be required to attend a Seminar, credit for which to the amount of four hours will be given.

COURSES IN GENERAL BIOLOGY

I. GENERAL BIOLOGY.—An introduction to the study of living things, designed to illustrate by the study of a few organisms the fundamental structure of living things. Two lectures or recitations and two laboratory periods.

First semester; 4 credit hours; Lect., T. Th., 10:30; Lab., two afternoons, time to be arranged.

II. GENERAL BIOLOGY.—Continuation of the preceding course. Considerable time is devoted to gaining a knowledge of the living organisms of the vicinity, illustrative of various topics taken up for study.

Second semester; 4 credit hours; Lect., T. Th., 10:30; Lab., two afternoons, time to be arranged.

III. INVERTEBRATE ZOOLOGY.—A general course in the morphology, classification and distribution of Invertebrates. Recitations, lectures and library work with two laboratory periods. Open to all students.

First semester; 4 credit hours; Recitations, T. Th., 8:30; Lab., time to be arranged. Additional credit may be obtained by working more time in laboratory.

IV. VERTEBRATE ZOOLOGY.—A continuation of course III, but may be taken separately. The study will include dissections of typical vertebrates, including the lower forms.

Second semester; 4 credit hours; Lect., T. Th., 8:30; Lab., time to be arranged. Additional credit may be obtained by working more time in the laboratory.

V. BACTERIOLOGY.—A general course, dealing with the various phases of the subject such as culture media, sterilization, methods of staining and mounting, etc. Lectures or recitations and laboratory.

First semester; 4 or 5 credit hours; Lect., T. Th., 9:30; Lab., time to be arranged.

VI. THE HUMAN BODY.—Advanced study for mature students, following the work as outlined in Martin's Human Body. Three recitations, with or without laboratory. Laboratory work may be taken for one of two hours of credit.

Second semester; 3 to 5 credit hours; M. T. F., 11:30; Lab., time to be arranged.

VII. ENTOMOLOGY.—A study of the anatomy and classification of insects, the orders and families, with use of keys for the determination of species; special attention will be given to beneficial and injurious insects. Two recitations and one to three laboratory periods.

First semester; 3 to 5 credit hours; Recitations, M. F., 8:30; Lab., time to be arranged.

VIII. METEOROLOGY.—A study of the weather and the phenomena in connection therewith, the conditions that make climate, weather maps, predictions, etc.

Second semester; 3 credit hours; Lect., M. F., 8:30; Lab., time to be arranged.

IX. PHOTOGRAPHY.—A study of lenses, cameras, paper, developers, etc., practical demonstration in printing, toning, developing, negative making, and the various manipulations necessary to produce a completed and perfect picture. This is not an elementary course, but demands a knowledge of both physics and chemistry, which are requisites for admission. No attempt is made at portraiture. The subject must be chosen for the year.

First semester; 2 credit hours; Lect., F., 11:30; Lab., F., 1:30.

X. PHOTOGRAPHY.—A continuation of course IX. The student is taught how to make lantern plates, transparencies, bromide enlargements, photomicrographs, and is given scientific objects to photograph. All laboratory work.

Second semester; 2 credit hours; time to be arranged.

XI. HISTOLOGY AND MICROSCOPICAL TECHNIQUE.—Practical work in the study of tissues, both animal and vegetable, together with practice in hardening, cutting, staining and mounting sections, uses of stains and reagents, and general practice in various kinds of microscopical preparations. Laboratory work, with occasional lectures.

First semester; 2 or 3 credit hours; time to be arranged.

XII. EMBRYOLOGY.—Lectures, library and laboratory, with special reference to the chick in the laboratory, working out the various stages of development. The work will involve the preparation of sections for the microscope, drawings, etc.

Second semester; 4 credit hours; time to be arranged.

XIII and XIV. ADVANCED STUDY.—Under this heading additional study along biological lines will be outlined for students desiring it. Those entering this work must have finished four of the preceding courses.

Both semesters; 4 or 5 credit hours; M. F., 9:30; Lab., time to be arranged.

XV. and XVI. GRADUATE COURSES.—Graduate students applying for work will be given every facility for study. Individual work will be suggested and supervised, and candidates will be encouraged to pursue studies for which they are fitted.

Both semesters; time to be arranged.

BIOLOGICAL STATION.—In addition to the courses here offered students are referred to the description of the work of the Biological Station. The courses of summer work are open to all who may choose to attend, and University credit is given for the amount of work satisfactorily completed during the summer.

REGULAR COURSES IN BOTANY AND FORESTRY

Major Requirements in Botany and Forestry

Students doing their major work in Botany will be required to take Botany I, II, V and VI, and Seminar work to the amount of four hours during the senior year. Also two years of German and French, and one year of Zoology (III and IV.)

Students doing their major work in Forestry are referred to the schedule of courses elsewhere suggested for four years' work. The courses required are Botany I and II, Forestry III, IV, VII and VIII; also German I and II and Zoology III and IV.

I. GENERAL BOTANY, STRUCTURES.—This course is offered with the object of giving a general review of the vegetable kingdom, considering the principal natural groups of plants from a systematic standpoint, with attention to life histories of typical forms. This work aims at a clear understanding of the form and structure of plans in their more general aspects.

First semester; 4 credit hours; T. Th., 9:30; Lab., W. F., 1:30.

II. GENERAL BOTANY, PHYSIOLOGY.—The second course deals with the conditions underlying growth and development, the subject of nutrition, the relations of plants to soil, light, temperature, and other factors in nature.

Second semester; 4 credit hours; T. Th., 9:30; Lab., W. F., 1:30.

III. FOREST BOTANY, DENDROLOGY.—The main part of the work contemplated under this subject is the classification of forest trees of the United States and Canada. It considers also the general system of classification and the characters of trees which define their

positions in the system. The form, structure and habits of our trees are the subjects of lecture and laboratory work, illustrated by specimens, lantern slides, etc. Herein is considered also the geographical distribution of species.

First semester; 4 credit hours; W. F., 10:30; Lab., T. Th., 1:30.

IV. FOREST BOTANY, SILVICULTURE.—The cultural side of forest botany as presented in this course deals with the effect of climate upon distribution, local and general, and such topics as have to do with the growth and life histories of different species, the relations of forests to matters of human interest, stream flow, erosion, sanitation, etc., the propagation of trees naturally and under cultivation.

Second semester; 4 credit hours; W. F., 10:30; Lab., T. Th., 1:30.

V. SYSTEMATIC BOTANY.—Under this title is treated the classification of flowering plants. The purpose is to familiarize the student with the characters of the principal families, especially those represented in the western flora.

Either semester; credit and time to be arranged.

VI. SYSTEMATIC BOTANY.—A continuation of course V, with attention to particular groups.

Either semester; credit and time to be arranged.

VII. FOREST PROTECTION.—In this course are considered the various influences inimical to forest life, such as diseases, especially those of fungus origin, fire, etc., and methods of treatment. Lectures, laboratory and field work.

First semester; 2 credit hours; time to be arranged.

VIII. WOOD STRUCTURE.—Chiefly a laboratory course on the structure and physical properties of woods; identification of woods, examination of gross and microscopic structure, etc.

Second semester; 2 credit hours; time to be arranged.

IX. EVOLUTION.—Lectures, reading and discussions on the subject from the standpoint of plant life; the historical development of evolutionary conceptions; consideration of recent experimental work and its relation to plant breeding and horticulture.

First semester; 1 or 2 credit hours; time to be arranged.

X. RESEARCH.—Opportunity is given for the pursuit of original work in the fields of structural and morphological botany, in ecology and in forestry, by graduate students and others showing special fitness for the work.

Both semesters; time to be arranged.

COURSES RECOMMENDED FOR AN UNDERGRADUATE FORESTRY COURSE

The University now provides courses affording opportunity to students looking forward to Forestry as a profession. The special opportunities for the study of Forestry at the State University consist not only in the courses offered, but also in its location with reference to the operations of the United States Forest Service. The headquarters of District Number 1 are in the city of Missoula. Several of the National Forests are within easy reach of the University. Thus the practical operations of

the Service are available for study the year round, and the valuable assistance of its expert officers has been freely given in lectures and other ways of practical value to the student of Forestry. The nature of the adjacent country also affords excellent opportunities for practical work, and many students find employment in timber surveys during the months of the summer vacation.

A thorough preparation for the profession of Forestry requires a liberal education in language, economics, mathematics and engineering, as well as in the collateral sciences of geology, physics, chemistry, biology and botany. The courses of study as at present outlined are designed to prepare students in the fundamental subjects of Forestry. From one to two years of graduate work will be necessary for those desiring to become professional foresters. It is the aim of the University to provide such courses of instruction as will enable students to meet the requirements for advanced standing in professional schools of Forestry.

The following schedule of courses is recommended, subject to changes, meeting individual needs or arising from conflicts of hours:

FIRST YEAR

First Semester	Second Semester
English Composition .....2 hours	English Composition .....2 hours
Mathematics I a and b.....5 hours	Mathematics II .....5 hours
Chemistry I .....4 hours	Chemistry II .....4 hours
Mechanical Drawing I a....2 hours	Mechanical Drawing I b....2 hours
Shop Work II a .....2 hours	Shop Work II b .....2 hours
Physical Culture .....½ hour	Physical Culture .....½ hour

SECOND YEAR

First Semester	Second Semester
Physics I .....4 hours	Physics II .....4 hours
Invertebrate Zoology III....4 hours	Vertebrate Zoology IV.....4 hours
Mineralogy IX .....3 hours	Petrology XII .....3 hours
Surveying III a .....2 hours	Surveying III b .....2 hours
Descriptive Geometry Ic....2 hours	Geology V .....2 hours
Physical Culture .....½ hour	Physical Culture .....½ hour

THIRD YEAR

First Semester	Second Semester
Botany I .....4 hours	Botany II .....4 hours
Entomology X .....3 hours	Meteorology .....3 hours
Geology I a .....2 hours	Systematic Botany V.....2 hours
German I .....5 hours	German II .....5 hours
Elective .....-.....2 hours	Elective .....-.....2 hours

FOURTH YEAR

First Semester		Second Semester	
German III	3 hours	German IV	3 hours
Dendrology III	4 hours	Silviculture IV	4 hours
Forest Protection VII	2 hours	Wood Structure VIII	2 hours
Economics I	3 hours	Economics II	3 hours
Elective	4 hours	Elective	4 hours

SHORT COURSE IN FORESTRY

CHARACTER OF THE SHORT COURSE

By joint agreement with the United States Forest Service, a special short course in Forestry is given at the University during January, February and March. This short course is designed to meet the special needs of forest rangers already in the Service, but is valuable also for students who may desire to enter the Service, as well as for others who may wish to acquire practical knowledge of the principles of Forestry.

The subjects of instruction are Dendrology, Silviculture, Forest Management, Surveying and Mapping, Mathematics, Geology and Mineralogy, Lumbering, Measurements, Timber Sales and Planting, Grazing, Office Administration. Lectures, laboratory practice and field demonstrations are given.

About one-half of the instruction is provided by the regular Faculty of the University. The remainder is given by expert officers of the Forest Service resident in Missoula.

Admission to this Special Short Course in Forestry is permitted without the customary certificates and examinations demanded of regular students. But applicants must give evidence of ability to carry on their special studies successfully, and they must be not less than nineteen years of age.

Applicants are expected to pay a Matriculation fee of $5.00, an Athletic fee of $1.00, and a deposit of $5.00 to cover cost of breakage and materials in laboratories.

The first Tuesday in January is the opening day of the course, and if possible registration should be made not later than that day.

STAFF OF INSTRUCTION IN THE SHORT FORESTRY COURSE

1910

Note.—The instruction by Forest Service officials is given in connection with their regular duties in the Service.

J. E. KIRKWOOD . . . . . Professor of Botany and Forestry
Dendrology and Silviculture.

L. C. PLANT . . . . . Professor of Mathematics
Mathematics of Forestry.

J. P. ROWE . . . . . Professor of Physics and Geology
Geology and Mineralogy.

ALLSTON DANA . . . . . Instructor in Engineering
Surveying.

W. G. WEIGLE . . . Supervisor Coeur d'Alene National Forest
Lumbering.

J. A. FITZWATER . Deputy Supervisor Absaroka National Forest
Mensuration.

R. G. POND . . . Deputy Supervisor Missoula National Forest
Timber Sales.

E. C. CLIFFORD . . . . . Chief of Planting, District No. 1
Planting.

C. H. ADAMS . . . . . Assistant District Forester in Charge of Grazing, District No. 1
Grazing.

J. T. JARDINE . . . . Grazing Expert of the Forest Service
Grazing.

M. J. KNOWLES . . . . . State Veterinarian
Care of Animals.

SHORT COURSES OF INSTRUCTION

DENDROLOGY.—This course deals with the classification of trees, their habitat and geographical distribution. Study of the structural features of the parts upon which classification is based. Lantern slides and other material are used for illustration. The work involves the use of the manual, and practice in the identification of plants, the study of wood sections, etc. Text, Sargent's Manual of the Trees of North America.

SILVICULTURE.—The work in silviculture considers the relation of forests to factors of soil and climate, the influence of water, light, temperature, etc., on the growth, form and distribution of trees; migrations and reforestation; life histories; the application of the theoretical considerations in matters of forest management. Text, Green's Principles of American Forestry.

SURVEYING, MAPPING AND DRAFTING.—This course covers the theory and practice of compass and chain surveying, including practice in platting maps from data taken in the field, together with necessary computations for calculating areas, etc.

MATHEMATICS.—This course deals with such subjects and problems as are of practical use to the forester. While elementary in character and independent of previous training, the course aims to instruct in the mathematical operations of simple surveying.

GEOLOGY AND MINERALOGY.—The subjects of rocks and minerals are presented in lectures and laboratory work. They are studied with special reference to occurrence, identification and relations to forest problems.

LUMBERING.—This course deals with the methods of logging and milling adapted to forest conditions in the Northwest.

MEASUREMENTS.—This course provides instruction in the general methods of measuring logs, fuel, lumber, standing trees and bodies of timber, with field practice.

TIMBER SALES.—The course includes complete instructions on the methods used by the Forest Service in the management and selling of National Forest timber.

PLANTING.—The methods of artificial forestation used by the Service, nursery work, sowing tree seeds, planting, etc., are studied.

GRAZING.—This course covers the different methods used throughout the United States in handling large areas of range land, the grazing policy and regulations of the Service.

ADMINISTRATION OF NATIONAL FORESTS.—One afternoon a week is given to this subject under the direction of the several officers in the District offices in Missoula.

Besides the required subjects, a number of supplementary elective courses are offered for the accommodation of those whose training in these subjects has been inadequate, and for any others who are interested. These courses will be especially helpful and are recommended for careful consideration. They include the subjects of chemistry, botany, zoology, geology, physics, mathematics and English.

BIOLOGICAL STATION

The work of the Station begins early in July and continues four weeks. Persons desiring to join the Station workers and carry on some line of study will be afforded every opportunity. There are good facilities for making collections, either for study or for school use.

The University of Montana Biological Station has 160 acres of land, given by act of Congress. This is in three tracts in separate places. At Yellow Bay, on the east side, 80 acres were selected; 40 acres were taken on Wild Horse Island and 40 on Bull Island. Camps will be made at each of these places during the summer.

Persons desiring to join in the summer camps and study should make early application to the Director, so the necessary arrangements can be made. An invitation is extended to any interested person to join the party.

There are three boats for use in the work, a gasoline launch, a row boat, and a canvas boat. Numerous smaller pieces of material, a pump after plans of Ricker, Plankton net after plans of Kofoid, insect nets, dredges, camp material, and other necessary appliances are supplied, while microscopes, chemicals, glassware, and books are taken annually from the University for use at the Station.

The Station was opened in 1899, and for the past eleven summers has been occupied from June until September or October. During this time some fifteen states have been repre-

sented, and the Station has become well known to many American naturalists.

There are no expenses in connection with work at the Station except for the cost of living and excursions.

Persons desiring to use the Station material before or after the time mentioned above may have the privilege of doing so. Usually there is some one at work from June until September. Special circulars give information regarding each season's work of the Station. All inquiries should be addressed to the Director, Morton J. Elrod, Missoula, Montana.

PHYSICS AND GEOLOGY

MAJOR REQUIREMENTS IN PHYSICS

A student making Physics his major subject will be expected to take, in addition to his work in Physics, courses I, II, III and IV in Mathematics, courses I and II in Chemistry, and courses I, II, III and IV in German or French. Other courses in Mathematics, Astronomy, Chemistry or Engineering may be prescribed, according to the trend of the student's specialization and the end in view.

COURSES IN PHYSICS

I. MECHANICS, MOLECULAR PHYSICS AND HEAT.—This course comprises about twenty-five of the fundamental and representative problems which, experimentally, will yield quantative results. It is required of all students in Engineering. Prerequisite: High School Physics; Mathematics I and II.

First semester; 4 credit hours; Lect., M. Th., 11:30; Lab., T. F., 1:30.

II. ELECTRICITY, SOUND AND LIGHT.—This course is a continuation of course I, and with it constitutes a general survey of the subject. It is required of all students in Engineering. Prerequisite: Physics I.

Second semester; 4 credit hours; Lect., M. Th., 11:30; Lab. T. F., 1:30.

III. GENERAL PHYSICS.—This is a lecture demonstration course. It takes up the topics of college Physics that cannot be successfully treated by the laboratory method with the average college student. It completes the general survey of college Physics. Prerequisite: Physics II.

First semester; 3 credit hours; T. W. F., 10:30.

IV. ADVANCED LIGHT.—This is primarily a laboratory course in the advanced phases of the subject. Prerequisites: Physics II and III.

Second semester; 3 credit hours; time to be arranged.

V or VI. ADVANCED SOUND.—This is a lecture-laboratory course. The subject will be introduced with a study of Hydrodynamics. Prerequisites: Physics II and III.

First or Second semester; 3 credit hours; time to be arranged.

VII or VIII. ADVANCED HEAT.—This is primarily a laboratory course, similar to III above. Prerequisites: Physics II and III.

First or second semester; 3 credit hours; time to be arranged.

IX and X. ADVANCED EXPERIMENTAL PHYSICS.—This course will be entirely of a laboratory nature. The work will be an extension of the above advanced courses, or a repetition of some classical experiment. Prerequisites: Physics III, IV, V and VII; Mathematics IV.

Both semesters; 2 or 5 credit hours; time to be arranged.

XI. ELECTRICAL MEASUREMENTS.—This is a lecture-laboratory course dealing with the theory and practice of electrical measurements and measuring instruments. (See Eng'g. VI a). Prerequisites: Physics I and II.

First semester; 3 credit hours; Lect., M., 10:30; Lab., W. F., 1:30.

XIV. CULTURAL PHYSICS.—This is a lecture demonstration course intended for students whose preparation will not permit of their taking Physics I and II, but who desire some further acquaintance with the subject. Therefore, some of the fundamental and ordinary phenomena from each of the fields will be treated descriptively and nonmathematically. This course will not be accepted as a prerequisite to any other nor has it any prerequisite.

Second semester; 1 credit hour; F., 11:30.

MAJOR REQUIREMENTS IN GEOLOGY

Students desiring to specialize in Geology must take Chemistry I and II, Zoology III and IV, General and Systematic Botany one year, Physics I and II, and should have at least two years of work in German or one year in French.

COURSES IN GEOLOGY

I. GENERAL GEOLOGY.—This course is arranged for those students who do not intend to specialize in the subject of Geology but who wish to gain a general idea of the earth and its past history. It is primarily a lecture course and the lectures will be illustrated by lantern slides, stereographs, charts, relief maps, minerals and rocks from many localities. It is intended to be largely a cultural course, and is open to all students. Text, Chamberlain and Salisbury's College Geology.

First semester; 2 credit hours; Lect., M. W., 8:30.

I a. ENGINEERING GEOLOGY.—A course arranged primarily for students in the Engineering School; and devoted to the study of dynamic and structural geology, together with laboratory work on rocks, minerals and soils. Text, Scott's Introduction to Geology.

First semester; 2 credit hours; Lect., T. Th., 8:30; Lab., M., time to be arranged.

II. GENERAL GEOLOGY.—A continuation of course I. The study of Historical Geology by means of lectures, laboratory and field work. Text, Chamberlain and Salisbury's College Geology.

Second semester; 2 credit hours; Lect., M. W., 8:30.

III. GEOLOGIC PROCESSES.—Lectures, laboratory work and collateral readings on the action of wind, water, vulcanism, diastrophism, etc., in the work of changing the configuration of the earth's crust. Intended for students whose major is Geology. Text, Chamberlin and Salisbury's Geology, Vol. I.

First semester; 2 credit hours; Lect., M. W., 10:30; Lab., M., time to be arranged.

IV. HISTORICAL GEOLOGY.—Lectures and laboratory work. Intended to follow course III, but may be taken independently of it. A general review of the past life of the earth, both fauna and flora, with special reference to the locality and sequence of the same in the United States. Text, Chamberlin and Salisbury's Geology, Vols. II and III.

Second semester; 3 credit hours; Lect., M. W., 10:30; Lab., M., time to be arranged.

V. PHYSIOGRAPHY.—A careful study of the chief physiographic features of the earth, their origin, history, etc. Illustrated lectures, laboratory and field work. This course has been planned primarily for teachers. Text, Salisbury's Physiography for Advanced Students.

First semester; 2 credit hours; time to be arranged.

VI. INVERTEBRATE PALEONTOLOGY.—Lectures and laboratory work. A careful study of invertebrate fossils and their places in the geological time scale. Special attention will be paid to Montana fossils. Must be preceded by Invertebrate Zoology. Text, Eastman's Paleontology, Vol. I.

Second semester; 4 credit hours; time to be arranged.

VII. ADVANCED GEOLOGY.—A more careful study of the principles of Geology. Field and laboratory work and a thorough review of past and recent geological literature.

First semester; 2 or 4 credit hours; time to be arranged.

VIII. ADVANCED GEOLOGY.—A continuance of course VII.

Second semester; 2 or 4 credit hours; time to be arranged.

MAJOR REQUIREMENTS IN MINERALOGY AND ECONOMIC GEOLOGY

Students desiring to specialize or major in Mineralogy or Economic Geology should take Mathematics Ia and II, and Chemistry I and II, III or IV, V or VI, XXXIV, XXXV, XXXVIII, together with two years of German or one year of French.

COURSES IN MINERALOGY AND ECONOMIC GEOLOGY

IX. PHYSICAL MINERALOGY (ELEMENTARY CRYSTALLOGRAPHY AND PHYSICAL MINERALOGY).—A study of the elements of crystallography and the identification, by means of physical char-

acters and chemical tests, of 125 common minerals. Text, Rowe's Elements of Crystallography and Mineralogy.

First semester; 3 credit hours; Lect., T. Th.; Lab., T. Th., time to be arranged.

X. PHYSICAL MINERALOGY.—A repetition of course IX.

Second semester; 3 credit hours; Lect., T. Th.; Lab., T. Th., time to be arranged.

XI. ADVANCED MINERALOGY.—The determination and study of minerals as to their origin, locality, uses, etc.

Credit and time to be arranged.

XII. BLOW-PIPE ANALYSIS.—Chiefly laboratory work. The determination of many of the principal ore-forming minerals by means of physical properties, blow-pipe and other chemical reactions. Text, Penfield and Brush, Determinative Mineralogy and Blow-Pipe Analysis. Prerequisite: Mineralogy IX.

Second semester; 2 or 4 credit hours; Lab., T. Th. S., time to be arranged.

XIII. ORE MINERALS.—A careful study of the metallic minerals used as ores; primarily with reference to their origin, mode of occurrence, properties, both physical and chemical, locality and uses. The ores of gold, silver, copper, lead, zinc, and iron will be studied in this course. Primarily a laboratory course.

First semester; 2 credit hours; time to be arranged.

XIV. ECONOMIC GEOLOGY.—Lectures and assigned readings. A general study of the non-metallic and metallic economic geology of the United States, and especially Montana. Such non-metals as coal, oil, gas, gypsum, clay, building stones, etc., and such metals as gold, silver, copper, platinum, zinc, lead, mercury, etc., will be studied. Excursions will be taken to nearby mines and mills. Should be preceded by Geology III and IV. Texts, Ries, Economic Geology of the United States; Rowe, Economic Geology of Montana. Prerequisite: Geology I.

Second semester; 2 credit hours; M. F., 11:30.

XV. ADVANCED ECONOMIC GEOLOGY.—This course should follow course XIV, and is a careful study of the coals, oils, gas. etc., of the United States and other countries.

First semester; 2 credit hours; time to be arranged.

XVI. GENESIS OF ORE DEPOSITS.—Lectures, assigned readings and mine examinations. The basis of the work will be such books as Van Hise on Metamorphism; Posepny and others on the Genesis of Ore Deposits; Kemp, Ore Deposits of the U. S. and Canada; Phillips and Louis, A Treatise on Ore Deposits; Weed (Beck's), The Nature of Ore Deposits; and many U. S. Geological Reports such as the Butte Special Folio; Geology and Ore Deposits of the Coeur d'Alene District, Idaho; The Leadville District, etc.

Second semester; 2 or 4 credit hours; time to be arranged.

XVII. SPECIAL ADVANCED ECONOMIC GEOLOGY OR ORE DEPOSITS.—Character of work to be arranged upon application.

First semester; credit and time to be arranged.

XVIII. FIELD GEOLOGY.—The mapping and interpretation of the geology of certain localities.

Second semester; 2 credit hours; time to be arranged.

XX. SPECIAL GEOLOGY OR MINERALOGY.—Character of work to be outlined upon application.

Second semester; credit and time to be arranged.

XXII. PETROGRAPHY.—A careful study of rocks as to physical properties, locality, decomposition products, origin and uses.

Second semester; 3 credit hours; time to be arranged.

CHEMISTRY

MAJOR REQUIREMENTS

Students wishing to take Chemistry as a major subject will be required to take the following courses: General Chemistry, 8 hours; Qualitative Analysis, 5 hours; Quantitative Analysis, 5 hours; Organic Chemistry, 10 hours; Physical Chemistry, 8 hours.

Supplementary courses will be required as follows: English, I and II; German, I. II, III, IV; Mathematics, I, II, III, IV; Physics, I, II.

FOUNDATION COURSES IN CHEMISTRY

I and II. GENERAL CHEMISTRY.—A study of the fundamental laws of chemistry and of the properties and the relations of the more common elements and their compounds. Text, Alexander Smith's Chemistry for Colleges.

Both semesters; 4 credit hours; Lect., T. Th., 9:30; Lab., section I, M. W., 1:30; section II, T. Th., 1:30.

III or IV. QUALITATIVE ANALYSIS.—A study of methods for detecting and separating the principal bases and inorganic acids, followed by analysis of various substances in solid and liquid form. Must be preceded by courses I and II.

Either semester; 5 credit hours; Lect., T. Th., 10:30; Lab., M. W. F., 1:30.

V or VI. QUANTITATIVE ANALYSIS.—An introduction to quantitative methods and the chemistry upon which these are based. Students perform simple analyses which involve the use of apparatus ordinarily employed in analytical work. Must be preceded by courses I and II, III or IV.

Either semester; 5 credit hours; Lect., T. Th., 11:30; Lab., M. W. F., 1:30.

VII. GENERAL CHEMISTRY.—A brief course in General Chemistry intended for those who do not wish to specialize in chemistry, yet desire a knowledge of the subject.

First semester; 5 credit hours; Lect., M. W. F., 9:30; Lab., T. Th., 1:30.

COURSES IN ORGANIC CHEMISTRY

XI and XII. ORGANIC CHEMISTRY.—A study of the carbon compounds with reference to their properties and constitution. Special attention given to such matters as saturation, polymerzation, structural formulae and stero-isomerism. Prerequisite: Courses I and II, III or IV.

Both semesters; 5 credit hours; 3 lectures and 2 laboratory periods; time to be arranged.

XIII. ADVANCED ORGANIC CHEMISTRY.—A consideration of special topics and a study of research in organic chemistry.

Credit and time to be arranged.

XIV. ORGANIC PREPARATIONS.—A laboratory course in preparation of organic compounds.

Credit and time to be arranged.

COURSES IN PHYSICAL CHEMISTRY

XXI and XXII. PHYSICAL CHEMISTRY.—In this course a study is made of the more important principles of physical chemistry. The students will be required to solve a large number of problems, and the aim will be to develop power to deal with physico-chemical questions.

Both semesters; credit and time to be arranged.

XXIII and XXIV. PHYSICAL CHEMISTRY LABORATORY.

Both semesters; credit and time to be arranged.

XXV and XXVI. ADVANCED PHYSICAL CHEMISTRY.

Both semesters; credit and time to be arranged.

XXVII and XXVIII. ELECTRO CHEMISTRY.

Both semesters; credit and time to be arranged.

COURSES IN ANALYTICAL AND APPLIED CHEMISTRY

XXXI. HOUSEHOLD AND SANITARY CHEMISTRY.—A consideration of the problems met with in domestic science, as sanitation, preservation of food, food values, dietaries and beverages. Open to those who have had high school chemistry, course VII, or courses I and II.

First semester; 2 credit hours; time to be arranged.

XXXII and XXXIII. ADVANCED QUANTITATIVE ANALYSIS.—A continuation of V or VI.

Both semesters; credit and time to be arranged.

XXXIV and XXXV. TECHNICAL ANALYSIS.—Analysis of such bodies as are met with in commercial work. Analysis of minerals, iron and steel, foods, water, gas. Course V or VI is a prerequisite.

Both semesters; credit and time to be arranged.

XXXVI and XXXVII. ORGANIC ANALYSIS.—Analysis of organic substances. Courses V or VI, and XI and XII, are prerequisites.

Both semesters; credit and time to be arranged.

XXXVIII. ASSAYING.—Laboratory practice in grinding and sampling of ores, fire assay for lead, gold, silver, copper and bullion.

Also determinations involving the so-called wet methods. Must be preceded by courses I and II; should be preceded by courses III or IV and V or VI.

Second semester; credit and time to be arranged.

XXXIX. INDUSTRIAL CHEMISTRY.—A study of the chemistry involved in various manufacturing processes.

First semester; credit and time to be arranged.

XLV and XLVI. GERMAN READING.—A course in sight reading of current German chemical literature. Intended for advanced students.

Both semesters; credit and time to be arranged.

RESEARCH COURSES

L and LI. RESEARCH IN ANALYTICAL AND APPLIED CHEMISTRY.—Open to such students as may be properly prepared.

LII and LIII. RESEARCH IN PHYSICAL CHEMISTRY.—The problems under investigation during 1910, include the study of energy relations at the boundary between liquid phases, electromotive forces in fused salts and conductivity of salts in non-aqueous solvents.

COURSE IN CHEMICAL ENGINEERING

A course in Chemical Engineering, first established in 1909, is adapted to meet the needs of students who expect to devote their time to the application of chemistry to the arts. Since a great portion of the engineering problems met by a Chemical Engineer are problems in Mechanical Engineering, considerable attention is paid to that subject. For different lines of work requiring different preparation the student is allowed optional work. Students graduating from this course find employment as analysists, engineers, managers or superintendents having to deal with problems of construction of smelters, sugar refineries, gas plants, fertilizer works, and various other branches of industry where special preparation is necessary. For detailed information regarding the subjects in the course, descriptions in the various departments should be consulted. Students may be allowed a limited amount of substitutions.

SCHOOL OF ENGINEERING

GENERAL PLAN AND SCOPE OF THE SCHOOL

The rapid industrial development of the West makes the profession of Engineering one of very great importance. The University of Montana is contributing to the needs of the community which it serves by maintaining its School of Engineering, in which to give professional training in the main principles underlying the practice of Civil, Mechanical and Electrical Engineering. After finishing the four years' courses along

these lines the graduates will be prepared to go into successful practice or to undertake more advanced and specialized studies.

The principles of designing and constructing engineering projects, and the theoretical phases of engineering, are given prominence in order to cultivate that breadth which ultimately leads to the greater professional success. At the same time practical experience is provided in shops, drawing rooms, laboratories, and field exercises.

Outlines of the prescribed courses of study are given in an earlier section of this Register, under requirements for degrees. [See page 31]. Considerable provision is made for English, Modern Languages, Economics, Geology, Chemistry, Physics, Mathematics, besides the purely engineering courses.

The degree of Bachelor of Science in Engineering is conferred upon students successfully completing the regular four years' courses in any one of the main fields of engineering.

Specialization in Civil, Mechanical, or Electrical Engineering, may be pursued in the student's fourth year, the subjects in the first three years of work being almost identical.

ROOMS AND EQUIPMENT

The School of Engineering now occupies the whole of the first floor and basement of Science Hall. Occupying the front of the building are the offices, lecture rooms, and drawing rooms. At the rear, in the extension of the main building, are the wood shop, machine shop, forge room and foundry. In the basement are the boiler room, engine room, and laboratory.

The mechanical and electrical laboratory contains a 50-horsepower automatic Atlas engine, which furnishes power for the shops and laboratory apparatus. It is equipped with a Prony brake and the necessary rigging for taking indicator cards, and is also used for testing purposes. Three 70-horsepower multitubular boilers, which furnish steam for heating and power, are available for tests. In the boiler room there is a steam pump and the power equipment of the University Paul-system steam-heating plant, also available for testing purposes. There are calorimeters, indicator rigs, flow-of-steam apparatus, and other equipments for making steam engineering tests.

For experimental purposes, there are available, in addition to the boilers, engine, etc., already referred to, a 125-light 6,300-volt Brush arc-light generator, a Westinghouse rotary converter, and induction motor, a 15-kilowat direct-current generator, two 10 K. W. direct-current dynamos, an interpole variable speed direct-current motor, transformers, storage batteries, etc., and other instruments necessary for making electrical tests.

The fuel laboratory is equipped with the various instruments required for determining the heating value and the constituents of the various fuels; Parr calorimeters, the Junker calorimeter for heating value determinations, Hempel, Orsat and other gas analysis apparatus.

The cement testing laboratory contains a Fairbanks-Morse cement testing machine and other apparatus for the testing of cements.

For field work in surveying there is an excellent equipment, consisting of transits, levels, compasses, solar attachments, rods, chains, tapes, etc.

The drawing rooms are suitably equipped with drawing tables and drawing boards. A collection of standard works, proceedings of various American institutes and current standard periodicals is provided.

The wood ship is 30x40 feet in size, and is lighted from opposite sides. There are places for bench work, furnished with benches, vices, and tool-cupboards stocked with the necessary tools. Ten lathes of 11-inch swing enable an equal number of students to engage in wood turning. There is also a large wood-turning lathe of 16-inch swing and 12-foot bed, with double-ended spindle, for large work. A double circular sawing table, with cross-cutting and rip-saws, a wood-trimmer, and a grindstone, complete the equipment of the shop.

Adjacent to the wood shop is the machine shop, which is 30x27½ feet in size and is also lighted from opposite sides. Its equipment consists of a 16-inch swing engine lathe, with taper and screw-cutting attachments, and equipped with chucks, face-plates and the necessary tools; also a 32-inch swing drill press, a small drill press, a 16-inch shaper, a power hack-saw, a wet emery grinder, a double emery grinder, and benches with vices for chipping and filing. At one side of the shop, space is partitioned off for a tool room, in which are kept the tools for use in the shop. A checking system, similar to that employed in modern shops, is used, and forms a valuable part of shop instruction.

Adjacent to the machine shop is the forge shop, 30x30 feet in size. Eight Buffalo down-draft forges, served by a Buffalo combination blower and exhaust system, a small portable forge, a combination shearing and punching machine, together with a complete outfit of anvils, hammers, tongs and all the other tools necessary for forging, constitute the equipment of this part of the shops. This shop is well lighted by windows on two sides of the room.

The foundry is 30x30 feet in size and well lighted by win-

dows on two sides of the room. Its equipment consists of a No. 0 Whiting Cupola, a Sturtevant pressure blower, a core oven, a core-making vice and tools and apparatus necessary for foundry work.

COURSES IN MECHANICAL DRAWING AND DESCRIPTIVE GEOMETRY

I a. MECHANICAL DRAWING AND DESCRIPTIVE GEOMETRY.—A course of three 2-hour periods per week including both lectures and drawing exercises. The work covered includes free hand lettering; the use of drawing instruments; geometrical construction of numerous curves; the principles of orthographic projection; true lengths and true sizes; the intersection and development of solids; dimensioning, and the use of tracing cloth.

First semester; 2 credit hours; M. W. F., 9:30-11:30.

I b. MECHANICAL DRAWING.—A continuation of course I a covering the making of isometric drawings; the drawing of helical threads; the exact and conventional methods of drawing bolts and nuts; the making of a shop drawing of a simple machine, including free hand sketches with dimensions from the object, a detail drawing made from these sketches, and a tracing and blue print. Prerequisite: Engineering I a.

Second semester; 2 credit hours; M. W. F., 9:30-11:30.

1 c. DESCRIPTIVE GEOMETRY.—A course of two afternoon exercises a week including lectures, recitations and drawing. Problems relating to the point, line and plane in space, with practical examples met with in engineering. Also problems in shades and shadows and in perspective. Prerequisite: Engineering I a.

First semester; 2 credit hours; M. W., 1:30.

COURSES IN SHOP WORK

II a. SHOP WORK.—A course of two 3-hour exercises a week in carpentry, wood turning, pattern making, and foundry work.

First semester; 2 credit hours; M. F., 1:30.

II b. SHOP WORK.—A continuation of course II a with exercises in forging, chipping and filing, machine tool work, and metal turning.

Second semester; 2 credit hours; M. F., 1:30.

COURSES IN SURVEYING

III a. SURVEYING.—The use and adjustments of the level and the transit; taping; differential and profile leveling; surveying with transit and tape, and with transit and stadia; topography; the use of the slide-rule and the planimeter. Prerequisite: Mathematics II.

First semester; 2 credit hours; time to be arranged.

III b. SURVEYING.—Continuation of course III a. The use of the plane table and the solar attachment; computations for balancing a survey and supplying omissions; computation for areas; plotting and map making; United States land surveying; triangulation and geodetic surveying; topographical surveying and topographical drawing. Prerequisite: Engineering III a.

Second semester; 2 credit hours; time to be arranged.

COURSES IN MECHANISM AND MACHINE DESIGN

IV a. MECHANISM.—A study of the motions and forms of the various mechanisms occurring in machines, and the manner of supporting and guiding the parts independently of their strength, including the differential screw, the worm and wheel, belt and pulleys, cams, linkages, simple and epicyclic gear-wheel trains, differential pulleys, and gear-tooth construction. Prerequisites: Mathematics II and Engineering I b.

First semester; 2 credit hours; M. W. F., 9:30.

IV b. VALVE GEARS.—A study of the various forms of valve motions as applied to steam engines.

Second semester; 2 credit hours; time to be arranged.

IV c. MACHINE DESIGN.—The application of the principles of mechanics and strength of materials to the design of machinery. Each student makes the calculation for the design of some simple machine details and also a complete set of working drawings. Six hours a week, including lectures and drawing exercises. Prerequisite: Engineering IV a and V c.

First semester; 2 credit hours; W. F., 1:30.

COURSES IN MECHANICS AND STRENGTH OF MATERIALS

V a. MECHANICS.—The same as Mathematics V, which see.

Second semester; 3 credit hours; time to be arranged.

V b. MECHANICS.—The same as Mathematics VI, which see.

First semester; 3 credit hours; time to be arranged.

V c. MECHANICS OF MATERIALS.—The elastic properties of materials; stress and deformation; the theory of the stresses in beams; the flexure of beams; the theory of columns and arches; torsion; the stresses in cylinders, flat plates, hooks and springs. Prerequisite: Engineering V a.

First semester; 3 credit hours; time to be arranged.

V d. MATERIALS OF CONSTRUCTION.—Lectures and reading on the manufacture and physical properties of cast iron, wrought iron, steel, cement, concrete, timber, and other materials of engineering construction. Laboratory work in the testing of cement. Prerequisite: Engineering V c.

Second semester; 2 credit hours; time to be arranged.

COURSES IN ELECTRICAL ENGINEERING

VI a. THEORETICAL ELECTRICITY AND ELECTRICAL MEASURING INSTRUMENTS.—The principles of electricity, magnetism and electro-magnetism. The theory and use of electric measuring instruments, with laboratory practice. Prerequisite: Physics II and Mathematics IV.

First semester; 3 credit hours; M. W. F., 1:30.

VI b. DIRECT CURRENT DYNAMO, ELECTRIC MACHINERY.—The principles of the direct current dynamo; its operation as a generator and as a motor; power losses and efficiency; characteristic

curves; electric illumination and heating; distribution and wiring; storage batteries. Prerequisite: Engineering VI a.

Second semester; 3 credit hours; M. W. F., 1:30.

VIc. ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.—The theory of alternating currents, including the effect of inductance, capacity, frequency and wave form. The study of the alternating current transformer and of alternating current generators and motors. Prerequisite: Engineering VI b and Mathematics VII.

First semester; 3 credit hours; M. W. F., 9:30.

VI d. ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.—A study of the various types of apparatus for the generation, measurement, transformation, and utilization of alternating currents, such as transformers, alternators, synchronous motors, induction motors and synchronous converters. Electric transmission and distribution of power. Prerequisite: Engineering VI c.

Second semester; 3 credit hours; M. W. F., 9:30.

VI e. TELEPHONES.—Theory, construction and operation of telephone and telegraph systems.

First semester; 2 credit hours; time to be arranged.

VI f. LABORATORY.—Calibration of instruments and testing of direct current machinery.

First semester; 2 credit hours; T. Th., 1:30-4:30.

VI g. LABORATORY.—Testing of alternating current apparatus and machinery.

Second semester; 2 credit hours; T. Th., 1:30-4:30.

COURSES IN STEAM AND GAS ENGINEERING

VII a. ELEMENTARY STEAM ENGINEERING.—Boilers; furnaces; the combustion of fuels; reciprocating engines; valve gears. Prerequisites: Physics II and Chemistry II.

First semester; 2 credit hours; T. Th., 9:30.

VII b. TECHNICAL FUEL, GAS AND OIL ANALYSIS.—Lectures and laboratory instruction in the technical analysis of coals, illuminating and fuel gases and the products of combustion; the use of oils and oil analysis.

Second semester; 1 credit hour; time to be arranged.

VII c. THERMODYNAMICS OF THE HEAT ENGINE.—Principles of the mechanical theory of heat and their application to the various forms of steam engines and turbines, internal combustion engines, refrigerating machines, air compressors, etc.

Second semester; 3 credit hours; M. W. F., 10:30.

VII d. CENTRAL STATIONS.—A study of the construction, operation, maintenance and economy of power plants. Prerequisite: Engineering VII c.

Second semester; 3 credit hours; M. W. F., 8:30.

VII e. REFRIGERATION AND REFRIGERATING MACHINERY.—Artificial production of low temperatures and the applications of refrigerating machinery.

First semester; 2 credit hours; time to be arranged.

VII f. STEAM TURBINES.—Theory and construction of the principal types of steam turbines and their application.

First semester; 2 credit hours; time to be arranged.

VII g. GAS ENGINES, AND GAS PRODUCERS.—Two and four cycle engines, ignition devices, carburetors, etc. Theory and construction of gas producers. Manufacture of gases.

First semester; 2 credit hours; time to be arranged.

VII h. LABORATORY.—Calibration of instruments and the determination of the efficiencies of simple machines.

First semester; 1 credit hour; time to be arranged.

VII i. LABORATORY.—Determination of efficiencies and losses occurring in steam, gas, and gasoline engines, etc. Determination of power plant losses and efficiencies.

Second semester; 1 credit hour; time to be arranged.

COURSES IN HYDRAULIC ENGINEERING

VIII a. HYDRAULICS.—Hydrostatics; hydrodynamics; the flow of water through orifices, over weirs, through tubes and through pipes; the flow of water in conduits, canals, and rivers. Prerequisite: Engineering V a.

Second semester; 3 credit hours; time to be arranged.

VIII b. HYDRAULIC ENGINEERING.—Determination of water supply and flow in streams. A study of the various forms of water wheels and turbines. The turbine applied to power stations. Efficiencies and tests.

First semester; 3 credit hours; T. Th., 8:30-10:30.

VIII c. IRRIGATION AND DRAINAGE.—Rainfall; stream flow; evaporation; duty of water; classes of irrigation works; canal systems; alignment, slope and cross-section of canals; head works and diversion weirs; sluices, regulators and escapes; aqueducts and flumes; distributaries; application of water; pipe irrigation; storage reservoirs; dams; work of the Reclamation Service; land drainage; road drainage; tile underdrains.

First semester; 1 credit hour; time to be arranged.

VIII d. SANTITARY ENGINEERING.—Combined and separate sewerage systems; house sewage and storm water; design of sewers and sewage systems; the problem of sewage disposal and sewage purification.

Second semester; 2 credit hours; time to be arranged.

VIII e. WATER SUPPLY.—Quantity and quality required for water supply; per capita consumption and growth of population; sources of supply; intakes, wells and impounding reservoirs; precipitation works; pipe lines; equalizing reservoirs; distributing systems; fire streams and hydrants; loss of head and calculation for flow through compound pipe systems; cast iron, steel and wooden pipes.

Second semester; 2 credit hours; time to be arranged.

COURSES IN RAILROAD ENGINEERING

IX a. RAILROAD CURVES AND EARTHWORK.—Simple and compound curves; easement curves. Preliminary and location surveys; slope staking and earthwork computation; the mass diagram.

Second semester; 2 credit hours; time to be arranged.

IX b. RAILROAD ENGINEERING.—Maintenance of way; economics of railroad location, with a study of train resistance, grade and curvature; signalling; yards and stations; tunnels.

First semester; 2 credit hours; time to be arranged.

IX c. RAILROAD DESIGN.—Problems in locating a line of railroad upon a contour map; the proportioning of culverts; the design of track work, yards, station grounds, interlocking signals, and other practical railroad problems. Prerequisite: Engineering IX a.

Second semester; 1 credit hour; time to be arranged.

COURSES IN STRUCTURAL ENGINEERING

X a. SIMPLE STRUCTURES.—The application of the principles of mechanics and strength of materials to the design of simple engineering structures. Loads, reactions and internal stresses; wooden beams; the plate girder; roof trusses; the reinforced concrete beam; steel and reinforced concrete building construction; dams and retainings walls; the theory of earth pressure; foundations. Prerequisite: Engineering V c.

First Semester; 2 credit hours; time to be arranged.

X b. BRIDGES, DESIGN.—The theory of the design of plate girder and truss bridges for railroads and highways.

First semester; 2 credit hours; time to be arranged.

X c. BRIDGE DESIGN.—Each student makes the complete design and detail drawings for a plate girder railroad bridge, and the computations for a pin-connected Pratt truss. Prerequisite: Engineering X a.

Second semester; 2 credit hours; time to be arranged.

X d. ADVANCED STRUCTURES.—A study of various types of roof and bridge trusses; the determination of stresses in statically undetermined structures by the consideration of the elastic deformations; the deflection of a truss; the method of least work; cantilever bridges; draw bridges; arches of masonry, steel and reinforced concrete. Prerequisite: Engineering X a.

Second semester; 2 credit hours; time to be arranged.

SEMINARY AND THESIS

XII a. SEMINARY.—The preparation, reading and discussion by the students of papers on engineering topics of current interest, reference being made to transactions of engineering societies and engineering periodicals.

Second semester; 1 credit hour; time to be arranged.

XII b. THESIS.—The preparation by each student of a thesis consisting of an original investigation or design in some field of engineering.

First and second semesters; 3 credit hours; time to be arranged.

ENGINEERING CONTRACTS AND SPECIFICATIONS

XIII. CONTRACTS AND SPECIFICATIONS.—A study of the laws of contracts pertaining to engineering work and the preparation of engineering specifications.

Second semester; 2 credit hours; time to be arranged.

UNIVERSITY EXTENSION

GENERAL CHARACTER AND SCOPE

The University is prepared to respond to requests from any communities of the State desiring to have Lecture Courses. or single lectures, from members of the Faculty. Likewise provision is made for Correspondence Courses in the several departments.

The inauguration of these extension courses begins the fulfillment of plans for making the University serve the people of the State who may not be able to come to class rooms and laboratories on the campus. Lecture courses of varying lengths and on many different subjects may be had by organizations of interested persons in any part of Montana, provided they will enroll in sufficient numbers to meet merely the necessary expense of sending instructors to give the chosen courses. Since January of the present year courses of lectures have been given successfully in Missoula, Deer Lodge, Bozeman, Billings, Helena and Butte. Correspondence courses in Forestry and related subjects have been given to Forest Rangers during the present semester. Facilities for this kind of systematic home study under supervision of the Faculty of the University, are now extended to all the people of the State.

EXTENSION METHODS

LECTURES.—The several members of the Faculty will respond to requests for courses of lectures as outlined in a later paragraph. Clubs, lecture committees, literary societies, teachers' associations, church societies, labor unions, lodges, or organizations for this special purpose, may arrange to secure one or more courses to meet the needs of their members or communities. Suitable lecture rooms and hotel accommodations should be provided by those who are sponsors for each course. The instructor in each case will supply necessary syllabi or illustrative material. Lectures may be attended by those who desire merely to be hearers, or may be followed by those who will do systematic reading and who may wish to look forward to regular enrollment in the University.

CORRESPONDENCE.—The methods of conducting these courses involve: first, the registration of the student and the filing of a statement of his previous education; second, the sending to the student of lesson assignments, followed by questions on each lesson; third, writing of answers to questions and their forwarding to the University, by the student; fourth, the return of corrections and suggestions by the instructor; fifth, the taking of optional examinations when a course is completed. (This final step is necessary only when the student desires to apply for University credit for any course). Each course is designed to cover a definite field, and will be concluded when this has been accomplished, without the fixing of time limits. Ability to read and write English, and ambition to learn, are the only qualifications required.

EXPENSES

Fees for Lecture Courses must be somewhat variable, depending upon distance and expense and number of students enrolled in each course. A charge of $1.00 per person enrolled for a series of six lectures may be regarded as a basis for estimate.

Fees for Correspondence Courses have been fixed as follows: $10 for any one course; $16 for two courses taken together; $20 for three courses if enrolled for at one time. These amounts include the cost of correspondence from the University, the necessary outlines and laboratory materials, but do not cover the cost of books, stationery and postage which the student must provide for himself.

LECTURE COURSES OFFERED

For the academic year 1910-11 the following courses of lectures have been definitely arranged and will be given upon proper application. Additional courses may be announced in September.

PRESIDENT DUNIWAY:—

The American Revolution; six lectures.

Formation of the Constitution and Organization of the Federal Government; three or six lectures.

Modern Constitutional Governments, a Comparative Study of Great Britain, Germany, France, Italy, Austro-Hungary, Switzerland; three or six lectures.

PROFESSOR UNDERWOOD:—

Social Reform, a Study of Current Theories and Institutions for Economic Betterment; six lectures.

The Social Consciousness; six lectures.

PROFESSOR REYNOLDS:—

Formative Influences of the Shakespearean Drama; six lectures.

Poetry of the Present; six lectures.

The Play and the Playhouse; six lectures.

PROFESSOR BOOK:—

Applied Psychology; six lectures.

Experimental Pedagogy; six lectures.

PROFESSOR ROWE:—

General Geology; three or six lectures.

Mineralogy and Mining Geology; three or six lectures.

PROFESSOR ELROD:—

The Glacier National Park (with stereopticon); one lecture.

Lewis and Clark in Montana (with stereopticon); one lecture.

Forests and Their Utility (with stereopticon); one lecture.

The Wonders of the Sea; one lecture.

Birds as Friends and Foes; one lecture.

Animal Instincts and Intelligence; three or six lectures.

PROFESSOR KIRKWOOD:—

Popular Botany Series; one to six lectures.

Economic Botany Series; one to six lectures.

Evolutionary Series; six lectures.

Forestry Series; one to six lectures.

CORRESPONDENCE COURSES OFFERED

Courses by correspondence during the year 1910-11 may be had in Latin Composition and Reading, German Composition and Reading, English Composition, English Literature, Education, Economics, General Biology, Forestry, Mineralogy, Physics, General Chemistry, Teaching of Mathematics, Geometry, Calculus, Practical Mathematics, Surveying, Engineering.

Inquiries are invited on the details of these courses, their exact content and method being largely determined by the training and needs of applicants.

LETTERS AND REMITTANCES

Address all inquiries and make all remittances to The Registrar, University of Montana, Missoula.

CERTIFIED PUBLIC ACCOUNTANCY

Chapter 39 of the Session Laws of 1909, enacted by the Eleventh Legislative Assembly of the State of Montana, effective February 27th, 1909, provides for the regulation of the practice of public accounting in this State. The State University administers this law and issues certificates of competency to any person who:

(1) Is a citizen of the United States or who has in good faith and in the manner required by law declared his intention of so becoming.

(2) Is of the age of 21 years;

(3) Is of good moral character;

(4) Is a graduate of an accredited High School or has had an equivalent education;

(5) Has had three years' practical experience in accounting acquired in practice on his own account, or in the office of a public accountant, or in a responsible accounting position in the employ of a business corporation, firm or individual;

(6) Has successfully passed certain written and oral examinations prescribed by the law, or

(7) Is exempt under the section of the law applicable to persons having certificates of other states or countries, or under the temporary provision for the exemption of experienced accountants already practicing in the State; and

(8) Has paid in advance the fee of twenty-five dollars, as prescribed by the law.

The above mentioned examinations are held at least once each year and at least thirty days notice of the time and place of holding is given by advertisement in three representative daily newspapers of the State.

The first examination was held December 15th and 16th, 1909, and will be held annually in December or semi-annually in June and December.

Candidates for the examinations may obtain circulars of information and application blanks from the University or from any member of the Board of Examiners.

The application blank must be filled out in the candidate's own handwriting and signed and sworn to by the candidate in the presence of some one authorized under the laws of Montana to administer an oath, and, together with a bank draft or money order for twenty-five dollars ($25.00), payable to "University of Montana," be mailed to the University at Missoula.

If the University approves the application the candidate will receive a card of admission to the examination, and if he succeeds in passing the examination he will in due course receive a certificate.

If the University does not approve the application, the candidate will be duly notified of that fact and the fee will be returned.

In no event will the fee of twenty-five dollars ($25.00) be returned to the applicant after his application has been approved, but any candidate failing to pass the examination is entitled to take any one subsequent examination without payment of a second fee.

To insure consideration, applications should be in the hands of the University at least two weeks before the date set for the examination.

The provisions of the law are carried out by:

(a) A University Committee on Accountancy—consisting of Professors J. H. Underwood and L. C. Plant, and President C. A. Duniway.

(b) A Board of Examiners—consisting of three certified public accountants of the State of Montana appointed by the President of the University. The members of the present Board are: L. G. Peloubet, J. C. Phillips and Donald Arthur (Secretary), of Butte.

The law provides for the revocation of certificates for unprofessional conduct or other sufficient cause and for the punishment of any person falsely representing himself as being a Certified Public Accountant or as holding such a certificate.

QUALIFICATIONS FOR EXAMINATIONS

The following qualifications should insure the successful passing of the examinations:

(1) A good mathematical foundation.
(2) A comprehensive knowledge of bookkeeping.
(3) A knowledge of the fundamental principles of commercial law and the rules of evidence.
(4) A knowledge of business organization and management.
(5) Ability to speak and to write the English language clearly and concisely.
(6) Familiarity with the theory and practice of analytical accounting.
(7) Familiarity with the theory and practice of constructive accounting.
(8) A knowledge of the subjects of commercial arithmetic, commercial geography, industrial history, business ethics and the elements of constitutional law.
(9) The personal qualifications of integrity, business acumen and logical reasoning.

APPLICATIONS UNDER THE WAIVER CLAUSE

The law (section 4) exempts from examination the following applicants:

First, those who hold certificates as "Certified Public Accountant" in another State extending like privilege to this State; provided, that in the opinion of the Board of Examiners the requirements for such certificates are equivalent to the requirements in this State.

Second, those holding similar certificates of another country, the requirements for which are equivalent to those in this State; provided, that the applicant is either a citizen or has declared his intention to become such.

Third, persons of at least twenty-five years of age, whose qualifications were equal to those prescribed for applicants for examination, who were known to the Board of Examiners as competent and skilled accountants; provided, they should apply for certificates within one hundred and eighty days after the passage of the act.

Applicants under any of these provisions may obtain blanks from the University or the Board of Examiners and must pay the fee of twenty-five dollars as prescribed. These applications will be acted upon in the same manner as those for examination.

DEGREES CONFERRED, JUNE, 1909

Almeda Andrews	Bachelor of Arts (Classical)
George Edward Beavers	Bachelor of Science
Bess Margaret Bradford	Bachelor of Arts (Literary)
Dera Montana Buswell	Bachelor of Arts (Literary)
Ida May Cunningham	Bachelor of Arts (Literary)
Ceciel Katherine Dwyer	Bachelor of Arts (Literary)
Charles Frederick Farmer	Bachelor of Science (Engineering)
Marie Sophia Freeser	Bachelor of Science
Frederick Greenwood	Bachelor of Arts (Literary)
Berney Fred Kitt	Bachelor of Science (Engineering)
Frank Lewis	Bachelor of Science (Engineering)
Jennie Marguerite Lyng	Bachelor of Arts (Literary)
Gilbert Drake McLaren	Bachelor of Science
Edna Crete Pratt	Bachelor of Arts (Literary)
Mary Frances Rankin	Bachelor of Arts (Literary)
Florence Ethela Thieme	Bachelor of Arts (Classical)
William Montgomery Van Eman	Bachelor of Science (Engineering)
Alice Anne Wright	Bachelor of Arts (Literary)
George Cutler Westby	Master of Science
Howard Taylor Ricketts	Doctor of Laws

REGISTER OF STUDENTS, 1909-1910

ENROLLED IN REGULAR COURSES

Note.—Choice of major department is made at the beginning of the Junior year, except in technical departments. Credit hours are stated as completed by February 1, 1910.

Name	Credits	Major	Address
Allison, Herman Thomas	11½		Philipsburg
Anderson, Frances K.	43½		Missoula
Averill, Florence Hale	85½	Literature	Townsend
Baker, Leo Walter	46	Engineering	Missoula
Beard, LeBaron Wayne	9½		Missoula
Bell, Marie Louise	14½		Helena
Bennett, William A.	67	Economics	Anaconda
Bird, Dorothy Frances	9		Lo Lo
Bishop, Arthur Fowler	98	Forestry	Seattle, Wash.
Buck, Clarence Henry	40½	Engineering	Stevensville
Buck, Fred Sybrandt	29½	Engineering	Stevensville
Bullerdick, Millard S.	66	History	Sheridan
Burke, Mary Elizabeth	115	Latin	Missoula
Butzerin, Anna Hazel	107	Latin	Missoula
Butzerin, Eula Bernice	12½		Missoula
Cameron, Carl Ernest	15		Missoula
Catlin, Florence Elizabeth	109	Literature	Anaconda
Chapple, Constance Emily			Billings
Chisholm, Angus Downie	26	Engineering	Ontonogon, Mich.
Clanton, Willie	74½	Biology	Billings
Coffee, Eva	72	Biology	Missoula
Conner, Daniel Marion	37	Engineering	Darby
Cowell, Mabel Maude	12½		Choteau
Cronk, Opal May	104	Latin	Townsend
De Ryke, Florence	62½		Missoula
Deuel, Homer R.	98½	Engineering	Missoula
Dingwall, James Alexander	51½	Engineering	New Chicago

Dinsmore, Oliver Raymond	79	Engineering	Missoula
Dobson, Cecil Frank	20½	Engineering	Dickinson, N. D.
Eggleston, Charles Little	6		Anaconda
Eidell, Isma Caroline	95	Literature	Helena
Elrod, Mary Josephine	107	Biology	Missoula
Epperson, Bessie	1½		Missoula
Forbis, Clarence Jenks	86	Engineering	Missoula
Forbis, Hugh Temple	90	Geology	Missoula
Foster, Frances Folsom	106	Literature	Great Falls
Fox, Edna Theresa	107	Modern Languages	Twin Bridges
Freeze, Gladys Julia	16½		Missoula
Friday, Richard C. W.	16½	Engineering	Sigourney, Iowa
Garlington, Mable Alma	16½		Missoula
Gleason, Frank E.	77	Engineering	Florence
Golder, Viola May	14½		Missoula
Goodrich, Clara Mandiren			Kalispell
Gough, Nina Pearl	46½		Missoula
Graham, Dorothy Mary	115	Latin	Livingston
Green, Dorothy Dean	33		Helena
Greenough, Charlotte Cowell	15		Spokane, Wash.
Hansen, Mary	70	Biology	Missoula
Hansen, Peter Emil	5½	Engineering	Missoula
Henderson, Mary Josephine	112	Literature	Hall
Henderson, Renee Jane	111	Literature	Hall
Herman, Mabel E.	8		Missoula
Hill, Arthur Delos		Chemistry	Victor
Hoffman, Charles Henry	80	Engineering	Glasgow
Hollensteiner, Edna Frances	109	Latin	Lo Lo
Howell, Roxane	B. A.	Biology	Butte
Hubert, Ernest Everett	51	Forestry	Missoula
Huffman, Gladys Marguerite	16½		Butte
Hughes, Earl Franklin	14½		Missoula
Hughes, Ethel Grace	89½	Modern Languages	Missoula

Hunter, Birdie Florence	44½		Missoula
Ingalls, Mildred Franklyn	14½		Missoula
Ittner, William Frederick	76	Forestry	Red Lake Falls, Minn.
Johnson, John Charles	82	Engineering	Missoula
Johnson, Laura Seawright	106	History and Economics	Great Falls
Johnson, Maude	43½		Missoula
Johnson, Richard Leon	11	Engineering	Missoula
Kennett, Holter Percy	9½	Engineering	Helena
Kent, Fay Marie	27½		Missoula
Kramer, Cecil Inice	46½		Missoula
Leaf, Lizzie Beulah	105	Latin	Townsend
Lebkicker, Marie	14½		Missoula
Leech, Arbie Eugene	120	Economics	Dupuyer
Leech, Florence Mary	48½		Dupuyer
Leopold, Rose	15½		Helena
Lewis, Gladine	16½		Howard
Line, Robert Campbell	121	History and Economics	Columbus
Little, George Daniel	90	Geology	Missoula
Lovett, Ernest Kennedy	64½	Engineering	Miles City
Lovett, Olive Helen	104	Latin	Miles City
Lucy, Abbie Catherine	55	Modern Languages	Missoula
Lucy, Margaret Mary	79½	Literature	Missoula
Lyman, Hazel Marshall	15½		Butte
McCabe, Claude Frank	8	Engineering	Whitefish
McCampbell, Margaret Olivia	27½		Billings
McCowan, Charles Stuart	87½	Economics	Great Falls
McCullough, Massey Sanderson	91	Geology	Missoula
McCullough, Maude Brooks	40		Missoula
McFarlane, Gertrude Cornelia	32½		Whitefish
MacKay, Warren C.	34½	Engineering	Anaconda
McLean, Gladys Anne	84	History	Anaconda
Maclay, David Lamar	105	Mathematics	Florence
Maclay, Harry David	77	Engineering	Lo Lo
Maclay, Holmes	50	Geology	Florence

Marshall, Mary Lucile	82	Modern Languages	Missoula
Marshall, Walter Christy	13½	Engineering	Missoula
Mason, Marjorie E.	110	Modern Languages	Missoula
Mason, Milton	48½	Engineering	Missoula
Mathewson, Alice Seabury	16½		Anaconda
Matthews, Florence May	15½		Missoula
Metcalf, Helen Frances	37		Stevensville
Napton, Alice Lorraine	13½		Missoula
Napton, Kate Lanier	13½		Missoula
Nelson, Genevieve Enid	12½		Missoula
Nichols, Nora	13		Missoula
O'Rourke, Arthur William	45½		East Helena
Penman, Daisy Marjory	120	Latin	Columbus
Rankin, Grace Evelyn	36½		Missoula
Reardon, Stephen James	71	Engineering	Missoula
Richards, David Dudley	42½		Butte
Robertson, Annabelle	76	Latin	Hamilton
Rolfe, Martha Edith	96	Modern Languages	Monarch
Romney, Winifred	16½		Hamilton
Rosean, Edna Pearl	109	Literature	Columbus
Ross, Marjorie Lee	79	Modern Languages	Missoula
Russell, Cass Gerald		Engineering	Billings
Ryan, William Emmett	69	Geology	Dupuyer
Satterthwaite, Roberta	104	Literature	Iron Mountain
Savage, Azelie Agnes	48½		Missoula
Schmit, Joseph Michael	11	Engineering	Helena
Shull, Mary Patience	12½		Missoula
Shunk, Shirlie	45½		Missoula
Simpkins, Eleanor Gertrude	14		Missoula
Simpson, Morton Dixon	80	Engineering	Stevensville
Sleeman, Florence	39½		Stevensville
Sloan, Royal Daniel	15½	Engineering	Mount Vernon, Mo.
Smith, Louise Elizabeth	15½		Victor

Smith, Ralph Wallace	63	Engineering	Missoula
Spaulding, Thomas Claude	B.S., M.S.	Biology	Missoula
Speer, Owen Duguid	16½		Ray, Ind.
Spencer, Harvey George	77	Chemistry	White Sulphur Springs
Steele, Mary Edith	86	Biology	Billings
Stoddard, Frederick Thayer	104½	Geology	Missoula
Stone, George Putnam	5		Missoula
Tait, William James	119½	Engineering	Missoula
Taylor, James	14		Thompson
Taylor, John Baker	37½		Missoula
Thieme, Fred Ernest	54½	Engineering	Missoula
Van Engelen, Beulah	49½		Missoula
Vealey, William David	4		Missoula
Vivian, Nan Kelsall	37		Butte
Warren, DeWitt Cregier	65	Economics	Chicago, Illinois
Wear, Helen Adelaide	56½		Helena
Wells, Roscoe W.	15½		Fridley
Wharton, Carolina Pack	40		Butte
Whipple, Gertrude Aletta	52½		Townsend
Whitaker, Jocelyn Alfred	74	Forestry	Missoula
Whitaker, Helen Margaret	104½	Literature	Missoula
Wilkins, Ruth Bernice	37½		Missoula
Williams, Lillian	93	Literature	Deer Lodge
Winninghoff, Wilford Joseph	122	Chemistry	Philipsburg
Winninghoff, Rose			Philipsburg
Winstanley, Edward Alexander	45	Geology	Missoula
Wright, Ida Fayette	45½		Butte

ENROLLED IN SHORT FORESTRY COURSE, JANUARY, FEBRUARY, MARCH

Note.—Forest Rangers whose names are marked with an asterisk were obliged to withdraw at the end of the third week on account of a decision by the Comptroller of the Treasury.

*Abbott, Arthur Dale	Red Lodge, Montana
Armitage, Sidney Cole	Billings, Montana
Arrison, D. William	White Bird, Idaho
*Beal, Orion Lester	St. Regis, Montana
*Beatty, Dwight Luther	Missoula, Montana
*Belb, John Watson	Sheridan, Montana
Bening, Frank Fred	Troy, Montana
Breen, J. Elmer	Prairie Farm, Wisconsin
*Brownell, Leslie Marian	Ely, Minnesota
*Bucher, Adolph Joseph	Townsend, Montana
*Calbick, Allen O.	Essex, Montana
*Cleaveland, Horace Annis	Bozeman, Montana
*Crawford, Chipman Langford	Rose Lake, Idaho
*David, John Edward	Melrose, Montana
De Groot, Peter	Kalispell, Montana
*Donery, Joseph A.	Cass Lake, Minnesota
*Durgan, Edward C.	Pine Creek, Montana
*Feary, Alfred Joseph	Priest River, Idaho
*Findley, Sterling Hyde	McAllister, Montana
Fischer, William	Belleview, Montana
Fitting, Ray R.	Kooskia, Idaho
Forster, James Ernest	Belmont, Montana
Griffin, Claude W.	Thompson, Montana
Grigg, Alfred	Stearns, Montana
*Gumaer, Robert Martin	Sandpoint, Idaho
*Hays, Samuel Robert	Bozeman, Montana
Hollensteiner, Annin Walter	Lo Lo, Montana
*Holt, Lewis Thomas	Rimini, Montana
*Howell, Charles F.	Snyder, Idaho

*Hughes, Fred E.	French Gulch, Montana
*Jarvis, Charles E.	Philipsburg, Montana
*Kierstead, John Alexander	Evans, Montana
*Martin, George Edwin	Jackson, Montana
*MacAbee, James William	Ione, Washington
*Morgan, Lewis Thomas	Neihart, Montana
*Owings, William Alfred	Midvale, Montana
Parker, Hosea F.	Roscoe, Montana
Phillips, Albert Le Roy	Missoula, Montana
*Porter, Gardner Ives	Elk City, Idaho
Raymond, William A.	Libby, Montana
*Sheriff, Ralph Edwin	Camp Crook, South Dakota
*Shy, James D.	Stacey, Montana
Siebentritt, George	Miner, Montana
Spencer, Roy Hascall	White Sulphur Springs, Montana
Sutherland, Baigrie	Bigfork, Montana
*Tanner, Earl Byron	Darby, Montana
*Thompson, Benjamin Franklin	Townsend, Montana
Weholt, Adolph	Kooskia, Idaho
Wilson, Emery E.	Hayden Lake, Idaho
Winnington, John Roy	Missoula, Montana

ENROLLED IN EXTENSION COURSES, JANUARY, FEBRUARY, MARCH

Billings (a course of six lectures)	109
Bozeman (a course of six lectures)	80
Butte (a course of six lectures)	59
Deer Lodge (a course of six lectures)	28
Helena (two courses of six lectures each)	159
Missoula (two courses of six lectures each)	109

SUMMARY OF ENROLLMENT

In regular courses	154
In Short Forestry Course	50
Total at the University	204

Note.—The above numbers do not include special students of the Department of Music, or students doing summer work at the Biological Station.

In Extension Courses	544

REGISTER OF ALUMNI

1898

Mrs. Ella Rob Glenny, B.A. . . . . Livingston
Eloise Knowles, B.Ph. . . . . Beecher Hall, University of Chicago, Chicago, Ill.

1899

Zoe Bellew (Mrs. Sidney M. Ward), B.A. (M.A., 1902) . Hamilton
Earl Douglas (B.S. Iowa State College), M.S. . . . . Carnegie Institute, Pittsburgh Pa.
Anna Louise Hatheway (Mrs. W. D. Harkins), B.S. . . Missoula
George Hempstead Kennett, B.S. (M.D., Rush Medical College) . . . . . Kellogg, Idaho
Helen McCrackin, B.A. (M.A., University of Chicago) . . Hamilton
Charles Pixley, B.A. (M.D., Rush Medical College) . . . Missoula

1900

Charles Earl Avery, B.Ph. . . . . Missoula
Mary Gertrude Buckhouse, B.S. . . . . Missoula
Caroline Harrington Cronkrite (Mrs. C. T. DeWitt Grubbs) B.S. . . . . Sixth Infantry, Cebu, P. I.
Lu Knowles (Mrs. R. J. Maxey), B.S. . Madison Barracks, New York
Eben Hugh Murray, B.A. . . . . Foster
Percey Shelley Rennick, B.Ph. (M.D., Kentucky Medical College) . Victor
Sidney Elery Walker, B.S. (LL.B., University of Michigan) . . . . . (Address unknown)

1901

Estelle Bovee, B.Ph. . . . . Cedar Mountain
Hugh Alexander Graham, B.S. . 1525 Mission St., San Francisco, Cal.
Sue Lewis (Mrs. W. A. Thompson), B.A. . . . . 1802 College Ave., East St. Louis, Ill.

Mary Lewis (Mrs. W. B. Simpson), B.A. . . Leavenworth, Wash.
Lydia Jimmie Mills (Mrs. C. H. Rittenour), B.S. . . . . Plains
Bertha Simpson, B.Ph. . . . . Missoula
Sidney Mire Ward, B.Ph. . . . . Hamilton
George Cutler Westby, B.S (in M.E.) (M.S.,1909) . . . Merlin, Ore.
Kathryne Clara Wilson, B.Ph. . Inland Herald Bldg., Spokane, Wash.

1902

John Frederick Anderson, B.S (in M.E.) . . . . . 928 Pearl St., Wallace, Idaho
George Barnes, B.A. (Classical) (D.D. Oxford University) . . . . . Coldwater, Mich.
Harold Blake, B.S. (in M.E.) . . . . . Anaconda
William O. Craig, B.S. . . . . Helena
Helene Kennett, B.A. (Literary) . . . . . Missoula
Helen La Caff (Mrs. Roy Jackson), B.A. (Classical), (Deceased) .
Agnes McDonald, B.A. (Classical) . . . . . Anaconda
Homer McDonald, B.S. . . . . Great Falls
Alexander Grant MacGregor, B.S. (in M.E.) . . . . . 118 T. St., Salt Lake City, Utah
Fanny Maley, B.A. (Literary) . . . . . Missoula
Helen McPhail, B.A. (Classical) . . . . . New Chicago
Jeannette Pickering Rankin, B.S. . 4230 14th Ave., N.E., Seattle, Wash.
Katherine Ronan (Mrs. Trask), B.A. (Classical) . . . . . 1124 E. 5th St., S., Salt Lake City, Utah
Margaret Ronan, B.A. (Classical) . . . . . Missoula
Pearl Scott (Mrs. Fritz Kroger), B.A. (Classical) . . Philipsburg
Guy Emerson Sheridan, B.S. . . . 659½ W. Granite St., Butte
Benjamin Stewart, B.S. . . . . Wallace, Idaho
Edith Watson (Mrs. C. H. Keel), B.A. (Classical) . . Red Lodge

1903

Myrtle Weber Avery (Mrs. Charles E. Avery), B.A. (Classical) . Missoula
Miriam Hatheway, B.A. (Classical) . . . . . Missoula
Mabel Emily Jones, B.A. (Literary) . . . . . Missoula
Martin Jones, B.S. . . . . Cabangan, Nueva, Luzon, P. I.
Lillian F. Jordan (Mrs. I. L. Bendon), B.A. (Literary) . . Glendive
Rella Likes, B.A. (Literary) . . . . . Missoula
Lucy Likes, B.A. (Literary) . . . . . Missoula
Claude Otto Marcyes, B.A. (Literary) . . . . . Forsyth
Ida Rigby, B.A. (Literary) . . . . . (Deceased)
Eloise Rigby, B.S. . . . . Carlton
Wellington Duncan Rankin, B.S. . . . . Helena
Harriet Laura Rankin (Mrs. Oscar Sedman), B.A. (Classical) Missoula
Leslie Mitchell Sheridan, B.S. (in M.E.) . . . . . Anaconda

Alice Herr, B.A. (Literary) . . . . . Dillon
Roxane Howell (Mrs. J. A. Derge), B.A. (Classical) . . . . . 901 W. Copper St., Butte

1904

Page Bunker, B.A. (Classical) . . . . . Kalispell
Moncure Cockrell, B.A. (Classical) . . . . . Deer Lodge
George Herbert Greenwood, B.A. (Classical) (M.A. Dartmouth College) . . . . . 1724 8th Ave., Spokane, Wash.
Walter Hammer, B.A. (Literary) . . . . . Billings
Georgia Evelyn Polleys, B.A. (Literary) . 927 S. 17th St., Lincoln, Neb.

1905

Jessie May Bishop (Mrs. E. P. Giboney), B.A. (Literary) . Great Falls
Anna F. Carter, B.S. . . . . Missoula
William Oran Dickinson, B.S. . . . . Missoula
Alice Gertrude Glancy, B.A. (Literary) . Box 216, Dayton, Wash.
Herbert H. Hughes, B.S. (Ph.G., Chicago School of Pharmacy) . . . . . 810 Ashland Block, Chicago, Ill.
John Ray Haywood, B.S. (in Engineering) . . . . Tooele, Utah
Avery Faulkner May (Mrs. W. O. Dickinson), B.A. (Classical) . . . . . Missoula
Charles Edward Schoonover, B.A. (Classical) . . . . (Deceased)
Frances Sibley, B.A. (Literary) . . . . . Marietta, Ga.
Charles Edward Simons, B.A. (Classical) . . . . . Missoula
Blanche May Simpson (Mrs. Frank Borg), B.A. (Literary) . Missoula
Ray Epperson Walters, B.A. (Classical) . 505 West 122nd St., N. Y.
Edward Williams, B.A. (Classical) . . . . . 209 Wells Fargo Bldg., Portland, Ore

1906

Fred Elliot Buck, B.S. (in M.E.) . . . . . Missoula
Joseph Buckhouse, B.S. (in M.E.) . . . . . Missoula
Maud Burns, B.A. . . . . Missoula
Edwin Reed Corbin, B.S. (in M.E.) . . . . . Nampa, Idaho
Mary P. Evans, B.A. (Classical) . . . . . Livingston
Grace Serena Flynn, B.A. (Classical) . . . . . Missoula
Thomas Leo Greenough, B.S. (in M.E.) . . . . . Missoula
Delbert I. Grush, B.S. (in M.E.) . . . . . Anaconda
Floyd Hardenburgh, B.S. . . . . Missoula
Florence Matilda Johnson (Mrs. J. J. Moore), B.S. . . . . 5509 Greenwood Ave., Chicago, Ill.
Maud Esther Johnson, B.A. . . . . Missoula
John Davis Jones, B.A. . . . . Ann Arbor, Mich.
Roy Daniel McPhail, B.A. . . . . New Chicago
Fay Abernathy Murray (Mrs. James Gilley), B.A. . . . . 701 W. Galena St., Butte

Alma Lottie Myers, B.A. . . . . Missoula
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Debora Wagy, B.A. . . . . Stevensville

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Charles Patrick Cotter, B.A. (Literary) . . . . . Townsend
Charles Scovill Dimmick, B.S. (in Engineering) . Schenectady, N. Y.
Frederic Eugene Dion, B.S. (in Engineering) . . . . Glendive
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Thomas Joseph Farrell, Jr., B.A. (Literary) . . . . . Missoula
Linda Ellen Featherman, B.A. (Literary) . . . . . Drummond
Mary Monica Fergus, B.A. (Literary) . . 213 N. Idaho St., Butte
Susie Garlington, B.A. (Classical) . . . . . Stevensville
Rufus King Garlington, B.S. . . . . Missoula
Ralph Edwin Gilham, B.S. . . . . Radersburg
Lawrence Edward Goodbourne, B.A. (Classical) . . Roseburg, Ore.
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James Hamilton Mills, B.S. (in Engineering) . . . . . Butte
Josiah John Moore, B.S. . . . 5509 Greenwood Ave., Chicago, Ill.
Frances Nuckolls (Mrs. E. P. Kelley), B.A. (Literary) . . . .
. . . . . 975 Copper St., Butte
William Hovey Polleys, B.S. (in Engineering) . . . . Billings
Joseph William Streit, B.S. . . . . Missoula
Montgomery De Smith, B.S. (in Engineering) . . . . Hamilton
Lillian Warren, B.A. (Classical) . . (Deceased February 22, 1908)
Alice Brown Welch, B.A. (Literary) . . 54 Scott St., Chicago, Ill.

1908

Ethel Olive Ambrose, B.A. (Literary) . . . . . Missoula
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Nell Cavette Bullard, B.A. (Literary) . . White Sulphur Springs

Vincent Stuart Craig, B.S. (Engineering) . . . . . 433 S. Hope St., Los Angeles, Cal.
Arthur George Davidson, B.S. (Engineering) . . . Tooele, Utah
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Herman Cole McGregor, B.S. (Engineering) . Salt Lake City, Utah
Arthur Ivason Morgon, B.A. (Literary) . . . . . 5849 McKinley Place, Seattle, Wash.
May Elizabeth Murphy, B.A. (Literary) . . . . . Helena
Ruth Lenore Smith, B.A. (Classical) . . . . . Stevensville
Helen Antoinette Smead, B.S. . . . . Missoula
James Beryl Speer, B.A. (Literary) . . . . . Missoula
Clarissa Eliner Spencer, B.A. . . . . Havre
Roy Newton Whitesitt, B.A. (Literary) . . . . . Stevensville
Edward Angus Wenger, B.S. (Engineering) . 741 W. Broadway, Butte

1909

Almeda Andrews (Mrs. Charles F. Farmer), B.A. (Classical) . Missoula
George Edward Beavers, B.S. . . . . Billings
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Dera Montana Buswell, B.A. (Literary) . . . . . Missoula
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Charles Frederick Farmer, B.S. (Engineering) . . . . Missoula
Marie Sophie Freeser, B.S. . . . . Helena
Frederick Greenwood, B.A. (Literary) . 1728 8th Ave., Spokane, Wash.
Berney Fred Kitt, B.S. (Engineering) . . . . . Bisbee, Ariz.
Frank Lewis, B.S. (Engineering) . . . . . Tooele, Utah
Jennie Marguerite Lyng, B.A. (Literary) . . . . . Highwood
Gilbert Drake McLaren, B.S. . . . . Astoria, Ore.
Edna Crete Pratt, B.A. (Literary) . 1310 S. Yakima St., Tacoma, Wash.
Mary Frances Rankin, B.A. (Classical) . . . Wellesley, Mass.
Florence Ethela Thieme, B.A. (Classical) . . . . . Missoula
Alice Anne Wright, B.A. (Literary) . . . . . Missoula
William Montgomery Van Eman, B.S. (Engineering) . . . . . 1146 Empire Bldg., Seattle, Wash.

HONORARY DEGREES CONFERRED

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Thomas H. Carter, LL.D. . . . . Helena
United States Senator

1902

Joseph K. Toole, LL.D. . . . . Helena
Governor of Montana

1904

Hiram Knowles, LL.D. . . . . Missoula
United States Judge

1909

Howard Taylor Ricketts, LL.D. . . . . (Deceased May 3, 1910)
Professor, University of Chicago

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The following scientific publications have been issued:

PSYCHOLOGY.—Studies in Psychology, edited by W. F. Book.

Vol. I. The Psychology of Skill, with Special Reference to its Acquisition in Typewriting, by William Frederick Book. Pages 185, plates 15, December 1, 1908. Price, $1.00.

BIOLOGY.—Morton J. Elrod, editor.

No. 1. The Summer Birds of Flathead Lake, by P. M. Silloway. Pages 83, plates 16, 1901.

No. 3. A Biological Reconnoissance in the Vicinity of Flathead Lake, by M. J. Elrod. Pages 182, plates 29, 1902.

No. 5. Lectures at Flathead Lake. Pages 97, plates 6, 1903.

No. 6. Additional Notes to Summer Birds of Flathead Lake with Special Reference to Swan Lake, by P. M. Silloway. Pages 19, plates 7, 1903.

No. 7. Lichens and Mosses of Montana, by Wilson P. Harris and Caroline W. Harris. Pages 22, plates 7, 1904.

No. 10. Butterflies of Montana with Key for Determination of Species, by Morton J. Elrod. Pages 174, plates 14, 1906.

No. 11. A List of the Fishes of Montana with Notes on the Game Fish, by James A. Henshall. Pages 12, plates 1, 1906.

No. 14. Pictured Rocks, Indian Writings on the Rockcliffs of Flathead Lake, Montana, by Morton J. Elrod. Pages 10, plates 10, 1908.

No. 15. Montana Botany Notes, by Marcus E. Jones. Pages 75, plates 6, 1910.

N. B.—Numbers 2, 4, 8, 9, 12, 13, of Biological Bulletins were brief annual announcements of the Biological Station.

GEOLOGY—Jesse Perry Rowe, editor.

The Neocene Lake-Beds of Western Montana, and Descriptions of some New Vertebrates from the Loup Fork, by Earl Douglass. Pages 27, plates 4, 1900.

No. 1. Some Volcanic Ash-Beds of Montana, by J. P. Rowe. Pages 29, plates 9, 1903.

No. 2. Montana Coal and Lignite Deposits, by J. P. Rowe. Pages 82, plates 26, 1906.

No. 3. Some Economic Geology of Montana, by J. P. Rowe. Pages 70, plates 46, 1908.