

1-1-1908

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BULLETIN OF THE  
UNIVERSITY OF MONTANA  
NO. 58  
JUNE, 1909

# THE UNIVERSITY OF MONTANA



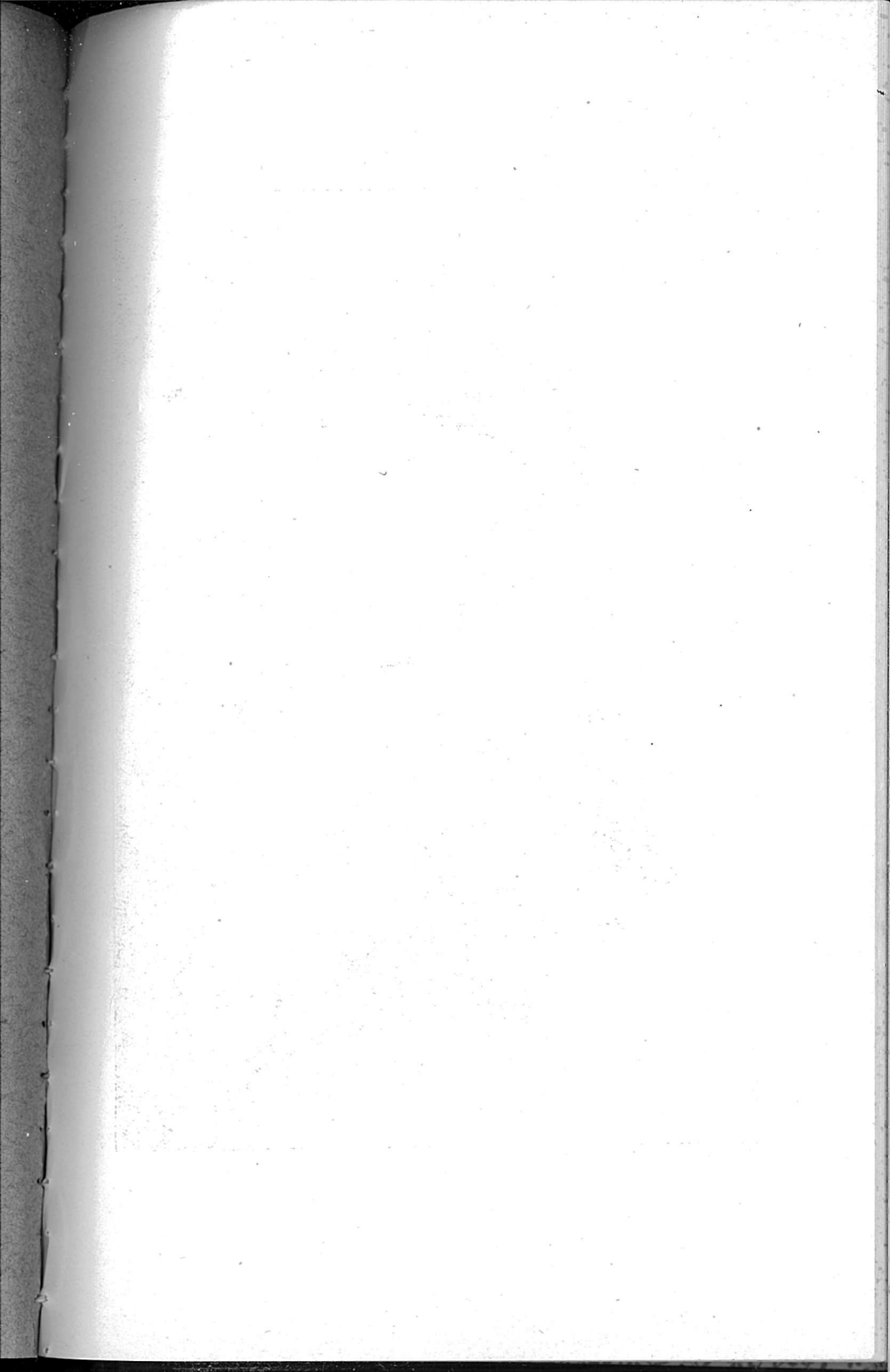
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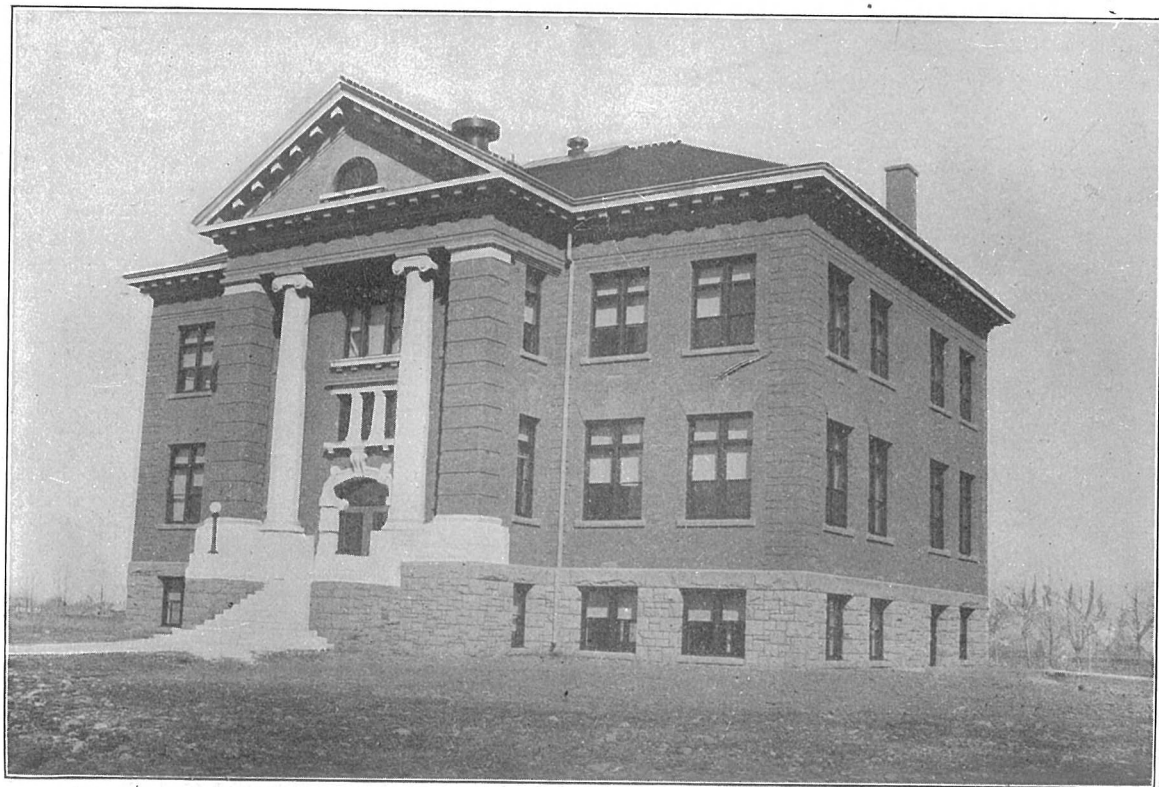
REGISTER, 1908-09

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









LIBRARY BUILDING

THE FOURTEENTH REGISTER

OF THE

University of Montana

MISSOULA, MONTANA

1908-09

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With Announcements for  
1909-10

# UNIVERSITY CALENDAR

## 1909-1910

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### FIRST SEMESTER

- Entrance examinations, Monday, September 13.  
Registration day, Tuesday, September 14.  
Instruction begins 8:30 a. m., Wednesday, September 15.  
Columbus day, a holiday, Tuesday, October 12.  
Thanksgiving recess, 12:30 p. m., Wednesday, November 24, to 8:30 a. m., Monday, November 29.  
Christmas holidays, 12:30 p. m., Wednesday, December 22, to 8:30 a. m., Tuesday, January 4.  
First semester ends, 4:00 p. m., Friday, January 28.

### SECOND SEMESTER

- Entrance examinations, Monday, January 31.  
Registration day, Tuesday, February 1.  
Instruction begins 8:30 a. m., Wednesday, February 2.  
Lincoln's birthday, a holiday, Saturday, February 12.  
Charter day, Thursday, February 17.  
Washington's birthday, a holiday, Tuesday, February 22.  
Buckley oratorical contest, Friday, April 15.  
Arbor day, a holiday, Tuesday, May 10.  
Interscholastic meet, Wednesday, Thursday, Friday, May 11, 12, 13.  
Memorial day, a holiday, Monday, May 30.  
Instruction ends 4:00 p. m., Friday, June 3.  
Baccalaureate day, Sunday, June 5.  
Annual recital, School of Music, 8:30 p. m., Monday, June 6.  
Class day, Tuesday, June 7.  
Alumni day, Wednesday, June 8.  
Commencement exercises, 10:30 a. m., Thursday, June 9.  
University luncheon, 1:00 p. m., Thursday, June 9.  
President's reception, 8:30 p. m., Thursday, June 9.



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# MONTANA STATE BOARD OF EDUCATION

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## EX-OFFICIO

GOVERNOR EDWIN 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

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## 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. . . . 500 University Avenue  
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.

CYNTHIA ELIZABETH REILEY, B. S. . . . 809 East Cedar  
Professor of Mathematics.

B. S., Glasgow College, Ky., 1889; Student at Moore's Hill College, Ind., National Normal University, Ohio, and Cornell University; Principal of Schools, Alexandria and Ft. Thomas, Ky.; Teacher in High School, Missoula; Professor of Mathematics, University of Montana, 1895 to September 1, 1909.

W. M. ABER, A. B. . . . . 212 S. 5th St. East  
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 and Secretary of the Faculty

Attended Public Schools, Barcelona, Spain; Graduate, Gymnasium, Frankfurt on the Main, Germany; B. M. E., Purdue University, 1893; A. C., same, 1894; Professor of Modern Languages and Secretary of the Faculty, University of Montana, 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, 1898-99; Professor of Biology and Physics, Illinois Wesleyan University, 1891-97; Professor of Biology, University of Montana, since 1897; Director, University of Montana Biological Station, since 1899.

FRANCES CORBIN, B. L. . . . . 310 S. 5th St. East

Professor of Literature.

Chicago Woman's College, 1885-87; New York State Normal School, Graduated, 1888; Student in Vassar College, 1890-92; 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; Chemist in Charge of Smelter. Smoke Investigations for the Mountain Copper Company, 1904; Instructor in Chemistry and Physics, University of Montana, 1900-01, and Professor of Chemistry, since 1901; absent on leave, first semester, 1909-10.

JESSE PERRY ROWE, Ph. D. . . . . 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, and Professor of Physics and Geology, since 1901; Director, University of Montana Geological Survey, since 1902; Assistant, United States Geological Survey, 1906.

WILLIAM FREDERICK BOOK, Ph. D. . . . . 212 S. 5th St. East

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 School, Indiana University, 1907; Professor of Psychology and Education, University of Montana, since 1906.

JAMES S. SNODDY, A. M. . . . . 218 S. 6th St. East

Professor of English and Rhetoric.

B. L., University of Missouri, 1883; A. M., University of Nebraska, 1893; Graduate Student, University of Chicago, Winter Session, 1893-94, Summer Sessions, 1895, 1896, 1899; Stan-

ford University, 1902-03; Acting Librarian, University of Missouri, 1885-87; Instructor, High School, Westport, Missouri, 1888-91, and Educational Institute, Kansas City, Missouri, 1891-93; Instructor in English, Woodson Institute, Richmond, Missouri, 1894-97; Teaching Fellow in English, University of Nebraska, 1897-98; Instructor in English, State Normal School, Valley City, North Dakota, 1898-1902; Instructor in English and Rhetoric, University of Montana, 1904-05, and Professor of English and Rhetoric, 1905 to September 1, 1909.

JOSEPH HARDING UNDERWOOD, Ph. D. . . . . 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. . . . . 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.

NATHANIEL R. CRAIGHILL, S. B. . . . .  
Professor of Engineering—In Charge of School of Engineering.

Graduate, Massachusetts Institute of Technology in Mechanical Engineering, 1893; in Electrical Engineering, 1894; Professor of Mechanical Engineering, North Carolina A. and M. College, 1895-97; Professor of Science and Mathematics, Powhatan College, Charlestown, W. Va., 1901-02; Professor of Engineering, University of Montana, 1907 to April 30, 1909.

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.

## CLEMENT AUSTIN COPELAND, M. E. . . . .

Professor of Engineering—In Charge of School of Engineering.

M. E., Cornell University, 1896; Assistant and Acting Professor, Department of Electrical Engineering, Stanford University, 1898-1900; Assistant Engineer, Power Department, Los Angeles Railway Co., 1896-97; Electrical Engineer, Copper Queen Mines, Bisbee, Arizona, 1897-98; Assistant Engineer, Edison Electric Co., Los Angeles, 1898; Superintendent of Distribution, Edison Electric Co., Los Angeles, 1900-04, Consulting Engineer, 1904-09; Professor of Engineering, University of Montana, from March to September, 1909.

## ARTHUR WILLIAM RICHTER, M. M. E. . . . .

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; Consulting Engineer, State Board of Control, Wisconsin; Professor of Engineering, University of Montana, beginning September 1, 1909.

## ALVIN J. COX, Ph. D. . . . .

Acting Professor of Chemistry.

B. A., Stanford University, 1902, and M. A., 1903; Ph. D., University of Breslau, 1905; Instructor in Chemistry, Stanford University, 1905-06; Chemist, U. S. Bureau of Science, Manila, since 1906; Acting Professor of Chemistry, University of Montana, September 1, 1909, to February 1, 1910.

## JOSEPH EDWARD KIRKWOOD, Ph. D. . . . .

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, beginning September 1, 1909.

## GEORGE FULLER REYNOLDS, Ph. D. . . . .

Assistant Professor of English and Rhetoric.

Ph. B., Lawrence University, 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; Head of English Department, Shattuck School, Fari-bault, Minn., 1902-09; Assistant Professor of English and Rhetoric, University of Montana, beginning September 1, 1909.



ELOISE KNOWLES, Ph. B. . . . .

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; abroad part 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; Dean of Women, University of Montana, since 1907.

GERTRUDE BUCKHOUSE, B. S. . . . . 120 S. 5th 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 . . . . . 402 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; Directed Physical Culture, University of California, 1904-08; 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 1908.

JAMES BERYL SPEER, B. A. . . . . 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, beginning September 1, 1909.

E. C. CLIFFORD, B. S. . . . .

Acting Instructor in Forestry.

B. S., University of Maine, 1904; Forest Service, 1904-05; Student, University of Michigan Forest School, 1905-06; Forest Service, since 1906; Chief of Planting, District No. 1 of U. S. Forest Service; Instructor in Forestry, University of Montana, February to June, 1909.

ALLSTON DANA, A. B., S. B. . . . . 204 S. 5th 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, beginning September 1, 1909.

WALTER ARTHUR, B. S. . . . . University Avenue

Instructor in Chemistry.

B. S., University of Missouri, 1907; Assistant in Chemistry, University of Michigan, 1907-08; Assistant in Chemistry, University of Montana, 1908-09, and Instructor in Chemistry, beginning September 1, 1909.

EUGENE F. A. CAREY, B. S. . . . .

Instructor in Mathematics.

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

ROBERT NEAL THOMPSON, B. S. . . . .

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, beginning September 1, 1909.

MABEL ROCKWELL SMITH, M. A. . . . .

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, beginning September 1, 1909.

MARGERY WINNIFRED FEIGNER, 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, beginning September 1, 1909.

MAUD McCORMICK, B. A. . . . . Gerald Avenue

Assistant in English and Rhetoric.

B. A., University of Missouri, 1906; Teacher in High School, Lumens, Mo., 1906-07; Teacher in High School, Llano, Texas, 1907-08; Assistant in English and Rhetoric, University of Montana, 1908 to September 1, 1909.

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### SPECIAL LECTURERS IN FORESTRY.

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

F. A. SILCOX . . . . . Assistant District Forester  
B. S., College of Charleston, 1903; M. F., Yale University, 1905.

ALBERT WILLIAMS COOPER . . . . . Chief of Silviculture  
A. B., Harvard University, 1901; M. F., Yale Forest School, 1903.

EDWARD CLINTON CLIFFORD . . . . . Chief of Planting  
B. S., University of Maine, 1904; University of Michigan, 1906.

DAVID TOWNSEND MASON . . . . Assistant Chief of Silviculture  
B. S., Rutgers College, 1905; M. F., Yale Forest School, 1907;  
M. S., Rutgers College, 1908.

PAUL D. KELLETER . . . . . Chief of Occupancy  
A. B., George Washington University, 1902; M. F., Yale Uni-  
versity, 1904.

ROBERT YOUNG STEWART . . . . Assistant Chief of Operation  
A. B., Dickerson College, 1903; M. A., Yale University, 1906.

WILLIAM MATTHEW AIKEN . . . . . District Law Officer  
LL. B., Yale University, 1908.

F. I. ROCKWELL . . . . . Assistant Chief of Products  
B. S. F., University of Minnesota, 1906.

### STUDENT ASSISTANTS

---

MILLARD S. BULLERDICK . . . . .	Assistant in Biology
MONTANA BUSWELL . . . . .	Assistant in Art
DANIEL M. CONNER . . . . .	Assistant in Physics
HOMER R. DEUEL . . . . .	Assistant in Physics
CHARLES F. FARMER . . . . .	Assistant in Shops
FREDERICK GREENWOOD . . . . .	Assistant in German
LAURA S. JOHNSON . . . . .	Assistant in President's Office
DONALD B. MCGREGOR . . . . .	Assistant in Shops
GILBERT D. McLAREN . . . . .	Assistant in Geology
DUDLEY D. RICHARDS . . . . .	Assistant in Mineralogy
EDNA P. ROSEAN . . . . .	Assistant in Library
ROBERTA SATTERTHWAITTE . . . . .	Assistant in Library
WILFORD J. WINNINGHOFF . . . . .	Assistant in Chemistry

---

### EMPLOYES

---

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

**STANDING COMMITTEES OF THE FACULTY, 1908-09**

---

**On Registration and Enrollment:**

Aber, Corbin, Copeland, Harkins, Reiley.

**On Schedule and Examinations:**

Aber, Book, Plant, Knowles, Stewart.

**On Student Affairs:**

The President, Rowe, Corbin, Scheuch, Harkins.

**On Athletics:**

Rhodes, Book, Stewart.

**On Public Exercises:**

The President, Snoddy, Corbin, Stewart, Underwood.

**On Graduate Work:**

The President, Elrod, Reiley, Scheuch, Snoddy.

**On Interscholastic Meet:**

The President, Aber, Book, Elrod, Rhodes, Rowe, Stewart.

**On Admission and Graduation:**

The President, Plant, Copeland.

**On Public Accountancy:**

The President, Plant, Underwood.

**On Recommendations:**

The President, Book, Plant.

## 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 Uni-



versity 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 direction of John M. Evans, J. H. T. Ryman and Dr. O. J. Craig, Building Commissioners, and the Library 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, provides for the furnishing of the Library building. It will be equipped and ready for occupancy in September of the present year.

### 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 sub-

stantial 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 will contain the general library, and also the Museum and several class rooms and offices.

#### 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 marks a new era in the University of Montana. Since only work of collegiate grade is to be 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.

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

## FIRST YEAR—SECOND SEMESTER

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

## COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

### SECOND YEAR—FIRST SEMESTER

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

### SECOND YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin— Caesar. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— Twice a week.	Latin— Caesar. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Botany, or Modern History. Drawing— Twice a week.	Latin, or Botany. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— Twice a week.	Commercial Arithmetic. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— 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. <div style="display: inline-block; vertical-align: middle; margin-left: 10px;">                         } Select two.                     </div>	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. <div style="display: inline-block; vertical-align: middle; margin-left: 10px;">                         } Select two.                     </div>	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.	Scientific Course.	English Course.	Commercial Course.
Latin— Vergil. English— History of English Literature. American History and Civics, or French, or German. Physics.	Trigonometry. Physics. English— History of English Literature. American History and Civics, or French, or German.	Physics. English— History of English Literature. American History and Civics. French. German. Latin. Trigonometry. <div style="text-align: right; margin-top: 10px;">} Select two.</div>	Correspondence. Bookkeeping. American History and Civics. Stenography and Typewriting.

### FOURTH YEAR—SECOND SEMESTER

Classical Course.	Scientific Course.	English Course.	Commercial Course.
Latin— Vergil. English— Masterpieces with applications of principles of English Grammar. American History and Civics, or French, or German. Physics.	Physics. English— Masterpieces with applications of principles of English Grammar. American History and Civics, or French, or German. Mathematics— Review.	Physics. English— Masterpieces with applications of principles of English Grammar. American History and Civics. Commercial Law Mathematics. French. German. Latin. <div style="text-align: right; margin-top: 10px;">} Select two.</div>	Commercial Law. Bookkeeping. American History and Civics. Stenography and Typewriting

## LIST OF ACCREDITED HIGH SCHOOLS

(June, 1909)

City	Principal
Anaconda . . . . .	A. P. Hickson
Billings . . . . .	J. A. Dallas
Butte . . . . .	G. F. Downer
Chinook . . . . .	G. H. Willman
Columbus . . . . .	James H. Doyle
Forsyth . . . . .	S. C. See
Fort Benton . . . . .	J. W. Lenning
Glasgow . . . . .	D. S. Williams
Great Falls . . . . .	J. W. Williams
Helena . . . . .	A. J. Roberts

County	Principal
Beaverhead—Dillon . . . . .	L. R. Foote
Broadwater—Townsend . . . . .	John M. Kay
Carbon—Red Lodge . . . . .	L. D. Fallis
Custer—Miles City . . . . .	H. R. Wallis
Dawson—Glendive . . . . .	Ralph L. Hunt
Fergus—Lewistown . . . . .	H. L. Sackett
Flathead—Kalispell . . . . .	G. A. Ketcham
Gallatin—Bozeman . . . . .	E. J. Parkin
Granite—Phillipsburg . . . . .	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—Chouteau . . . . .	B. E. Toan

## 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 1909-10 these days are September 13 and January 31.

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 must be familiar with the form and substance of the classics, or of their equivalents, in (a); and must possess a general knowledge of the subject matter in two or more of those in (b) of the following groups:

(a) Shakespeare's *Macbeth*, *Merchant of Venice*, and *Julius Caesar*; Macaulay's *Essay on Milton*, or *Essay on Addison*; Tennyson's *Idylls of the King and Princess*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*; Carlyle's *Essay on Burns*; Gayley's *Classic Myths*.

(b) Scott's *Kenilworth* or *Ivanhoe*; DeQuincy's *Revolt of the Tartars*; Eliot's *Silas Marner*; Dickens' *Tale of Two Cities* or *David Copperfield*; Wallace's *Ben Hur*; Blackmore's *Lorna Doone*; Kingsley's *Westward Ho*; selections from Addison's *Spectator*; Irving's *Life of Goldsmith*; Coleridge's *Rime of the Ancient Mariner*.

### 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).

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).

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.

#### REQUIREMENTS FOR GRADUATION

The organization of courses of study within the University has been quite changed by recent 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 modified 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 hours 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.

## 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.

## 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 two 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. In the first semester of the third year there is a similar choice between Mathematics VI and Engineering III b.

#### FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	No. Credits		No. Credits
Mathematics	I 5	Mathematics	II 5
Chemistry	I 4	Chemistry	II 4
Engineering, Drawing	I a 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		SECOND SEMESTER	
	No. Credits		No. Credits
Mathematics	III 5	Mathematics	IV 3
Physics	I a 4	Physics	II 4
Engineering, Desc. Geom.	I c 2	Engineering, Mechanism	IV a 2
Option, French or German	4	Engineering, Surveying	III a 4
Physical Culture	III ½	Option, French or German	2
		Physical Culture	IV ½

#### THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	No. Credits		No. Credits
Engineering, Mechanics	V 4	Engineering, Mechanics	VI 2
Engineering, Electricity	VI a 3	Engineering, Electricity	VI b 3
Engineering, Steam	VII a 2	Engineering, Steam and Gas	VII b 2
* Mathematics	VII } 2	Engineering, Materials	V c 3
Engineering, Surveying	III b }	Geology, Economic	2
Geology	I 2	Option	3 or 4
Option, Economics or History	2 or 3		

## FOURTH YEAR

For Both Electrical and Civil Engineering					
FIRST SEMESTER			SECOND SEMESTER		
		No. Credits			No. Credits
Engineering, Hydraulics	VIII a	2	Engineering, H'dr'lic M't'rs	VIII b	2
" Laboratory	XI a	2	" Laboratory	XI b	2
" Structures	X a	3	" Seminary	XII a	2
" Ther'd'n'm'cs	VII c	3*	" Thesis	XII b	1
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	" Dynamo Design	VI e	2
			" Central Stations	VII d	3
For Civil Engineering					
Engineering, Railroads	IX a	3	Engineering, Bridge Design	X b	2
" Irrigation	VIII c	1	" Structures	X c	2
" Stream Flow	VIII e	1	" Water Supply and Sewerage	VIII d	2
Astronomy		1	" Hyd. Design	VIII f	1
			" R. R. Design	IX b	1

\*NOTE.—Math. VII for Electrical Engineering. Eng'g III b for Civil Engineering. Eng'g VII c only 2 credits for Civil Engineering.

## 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 besides 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 who present themselves for registration after the official registration days (September 14, 1909 and February 1, 1910), 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 will take over the entire management of the Hall for 1909-10, 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 frater-



nities 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.

## 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 is 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 was held by Mr. William Van Eman, of Augusta, Montana, during 1906-09, and has been awarded to Mr. Arthur O'Rourke, of Helena, Montana, for 1909-12.

### KEITH SCHOLARSHIP

By the gift of John M. Keith, ex-mayor 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 instalments; 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. These testimonials should be supplemented by information showing the need of the applicant for financial assistance to enable him to pursue a University course. The scholarship can be granted only to a student who was one of the high school graduating classes 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 1909 by Millard Buller-dick, of Sheridan, 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 a member of the academic senior class.

**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 prize was won in 1909 by John Taylor, writing on the subject: "The National Conservation Policy."

**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**

This prize is 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**

Two medals are given in the Department of Music: One by Mrs. Bonner for advanced piano technique; the other by Mrs. Blanche Whitaker for effort and proficiency.

**MISCELLANEOUS****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 semester.

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. Both societies are a credit to the University, and 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 of 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.

Fraternalities 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 organization of Associated Engineers, 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. Ten annual contests have been held.

## THE UNIVERSITY PAPER

The Kaimin, through the effective efforts of its corps of editors, has become a permanent factor in the University life. The various difficulties incident to the launching of a new enterprise having been met, a University Press Club with a joint stock membership is publishing The Weekly Kaimin as a newspaper and will issue literary editions from time to time.

## 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 Board of Directors of the A. S. U. M.

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

First. The football season will extend from September 1st to Thanksgiving Day.

Second. No student shall participate in any collegiate contest unless he is a bona fide student carrying work equivalent to twelve credit hours in a regular or special course.

Third. One week prior to the playing of a proposed intercollegiate game a list of the players is to be submitted to the Faculty Athletic Committee. The Committee shall examine the list and shall strike from it the names of students whose scholarship or attendance is unsatisfactory, or whose status is improper. No student whose name is not found on the list as thus revised, shall be permitted to take part in any such contest.

Fourth. No engagement shall be made in general requiring:

- (1). More than \$300 expense.
- (2). More than three days consecutive absence on the part of the team.

Fifth. The following rules of eligibility, copied from the Montana Intercollegiate Athletic Association, are approved:

(1). No person shall be allowed to compete in any athletic contest who is not an amateur. An amateur is a person who has never competed for money, or under a false name, or has knowingly entered any competition participated in by any professional or professionals, or has knowingly competed with any professional, for any prize or token, or has at any time taught, pursued or assisted at athletic exercises for money or for any valuable consideration.

(2). No student registered after the fifteenth of October shall be eligible to play in any intercollegiate contest before February 1 of that

collegiate year. No student registered 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 collegiate year.

(3). 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 the work; provided, this does not apply to students who are forced to leave college 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 student 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.

(4). Students who have played one year while in a preparatory department may be allowed to enter athletic contests for five years; otherwise the limit shall be four years.

#### ANNUAL INTERSCHOLASTIC MEET

For six 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 a new policy was followed of making Missoula entirely neutral ground by requesting the Missoula County High School to assist 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. 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 1909 was held May 12, 13, 14, and that for 1910 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 three years, in 1907, 1908 and 1909, with marked success.

## THE LIBRARY

The General Library, consisting of about 15,000 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 is glad to extend all possible assistance to the high schools of the state. Under reasonable regulations, books and pam-



phlets 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, after the best patterns, 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.

## DEPARTMENTS AND COURSES OF INSTRUCTION

In the following statements a "course" extends through one semester. One credit "hour" per week is the equivalent of 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 I and II 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.



- I. CICERO, PROSE COMPOSITION.—De Amicitia, or De Senectute of Cicero. One half the time given to composition.  
First semester; 3 credit hours; M. W. F., 10:30.
- II. LIVY, PROSE COMPOSITION.—Selections from Books XXI and XXII. One half the time given to composition.  
Second semester; 3 credit hours; M. W. F., 10:30.
- 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., 9:30.
- VI. PLAUTUS, TERENCE.—Selected Comedies of Plautus and Terence.  
Second semester; 3 credit hours; M. W. F., 9:30.
- 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 the high schools of Montana do not 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., 9:30.
- II. BEGINNING GREEK.—Completion of First Greek Book and beginning Xenophon's Anabasis.  
Second semester; 5 credit hours; M. T. W. Th. F., 9:30.
- 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

I. COMPOSITION.—Required course for all first year students. First semester; 2 credit hours; at various times in three sections.

II. COMPOSITION.—Required course for all first year students, in continuation of course I.

Second semester; 2 credit hours; at various times, in three sections.

III. ADVANCED COMPOSITION AND RHETORIC.—Open to those who have passed courses I and II with high standing.

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

IV. ENGLISH PROSE.—Study of English prose style. Open to those who have taken courses I, II, III.

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

V. THE ENGLISH LANGUAGE.—History, questions of usage, synonyms, etc. For third and fourth year students.

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

VI. THE ENGLISH LANGUAGE.—Study of a special field, topic to be announced. An advanced course.

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

## 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 and two courses in History.

### COURSES OF INSTRUCTION

**Note.**—Composition I and II are prerequisite to the work in this department. Literature II is a prerequisite to all other courses in the department. Course V must be preceded by Course IV. Courses V, IX, and X are for advanced students only.

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 essay, poetry, drama, and fiction. Open to first year students.

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

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

First semester; 2 credit hours; T. Th., 9:30. Omitted in 1909-10.

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

First semester; 5 credit hours; M. T. W. Th. F., 9:30.

VI. ENGLISH LITERATURE, SHAKESPEARE — Advanced course. A careful and detailed study of five of Shakespeare's plays; for 1909-10, "Antony and Cleopatra," "Hamlet," "As You Like It," "The Tempest," "The Winter's Tale." Open to students who have completed course IV.

Second semester; 3 credit hours; T. W. Th., 1:30.

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

First semester; 2 credit hours; T. Th., 1:30. Omitted in 1909-10.

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

Second semester; 5 credit hours; M. T. W. Th. F., 9:30.

IX. ENGLISH LITERATURE, THE NOVEL.—A rapid historical survey of the origin and development of the English Novel, and the critical discussion of one novel each of Jane Austen, Scott, Dickens, Thackeray, George Eliot and Hawthorne. Open to second, third and fourth year students.

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

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

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

XII. ENGLISH LITERATURE.—Tennyson and Browning. The critical study of selections from Tennyson and Browning, comparing the style, philosophical ideas and theories of the poets. Open to advanced students.

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

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

First semester; 5 credit hours; M. T. W. Th. F., 11:30.

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

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

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.

## ELOCUTION

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.—Pantomimic action, recitation and oration.

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

II. PRACTICAL ELOCUTION.—A continuation of course I. Second semester; 2 credit hours; T. Th., 8:30.

III. PRACTICAL ELOCUTION.—Program construction and production.

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

IV. ORATION AND DEBATE.—The production of oration and debate, with special work in extemporaneous speaking.

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

## 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 in 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 Erzählungen*, *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*, *María Stuart*, *Minna von Barnhelm*, *Herrman 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 class 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 française*, *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.

A new psychological laboratory to be installed during the summer will occupy rooms in University Hall. It will be equipped with modern appliances and apparatus. Sets of standard journals and reference books are also available.

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.

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. Omitted in 1909-10.

IX. **ABNORMAL PSYCHOLOGY.**—A study of suggestion, hypnosis, 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 1909-10.

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 1909-10.

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 will be 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. Omitted in 1909-10.

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 1909-10.

### 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 37].

To supplement the laboratory and educational library and to assist special students of education a Pedagogical Museum has been planned and partially established.

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.

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, Monróe's History of Education.

Both semesters; 3 credit hours; M. W. F., 11:30. Alternates with courses I and II. Omitted in 1909-10.

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. Omitted in 1909-10.

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. Omitted in 1909-10.

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 will be 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 toward one major. Students may, however, elect either subject with the expectation that in the future sufficient work may 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. W. F., 10:30.

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. W. F., 10:30.

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. ECONOMICS.—Introductory analysis of the processes of the production and distribution of wealth as developed in recent economic theory; illustrations of economic organization from present industrial life.

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

II. ECONOMIC HISTORY.—The historical analysis of industry and property; the evolution of modern industrial forms and ideas; the industrial revolution of the eighteenth century; industrial history of the United States with a view to the understanding of present economic and social problems.

Second semester; 3 credit hours. Omitted in 1909-10.

III. MONEY AND BANKING.—The nature and functions of money; the history and present organization of the American monetary

system; the theory of credit; the history and description of the American banking system; banking methods; the conditions of a sound financial system; present financial problems.

First semester; 2 credit hours. Alternates with course V. Omitted in 1909-10.

IV. PUBLIC FINANCE.—Theory of finance; public expenditures; sources of revenue; financial policies; public debts; fiscal organization; the budget; system of taxation; present problems of taxation.

Second semester; 2 credit hours; T. Th., 9:30. Alternates with course VI.

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

First semester; 2 credit hours. Alternates with course III. Omitted in 1909-10.

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

Second semester; 2 credit hours. Alternates with course IV. Omitted in 1909-10.

VII. SOCIOLOGY.—The origin and development of social forms and forces, physical and psychical, as marriage, race, habit, magic; religion, amusements, customs; social control, public opinion, government, current ethics. An examination of contemporary society; a method of collecting and analyzing live sociological materials. Prerequisite: Economics I and at least one year in history.

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

VIII. SOCIOLOGY, HISTORY OF POLITICAL THOUGHT.—Ancient political ideas, especially those of Aristotle and Plato; the mediaeval writers; especial attention to the modern sociologists. An attempt to correlate the history of political theory with the development of culture.

Second semester; 2 credit hours. Omitted in 1909-10.

X. SOCIAL PROBLEMS.—An application of the principles of economics and sociology to the study of current questions and institutions; theories and institutions of social reform; agencies for social betterment and for the better distribution of wealth; sociological classification and criticism of current organizations and societies. This course will deal concretely with such questions as race, immigration, city life, marriage and divorce, and the political and industrial relations of women and children. Prerequisite: Economics I and at least one year of history.

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

XI and XII. SEMINAR IN ECONOMICS AND SOCIOLOGY.—Studies in selected topics and the discussion of individual researches. Open to properly qualified students.

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 OF 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 departments of Literature, History and Languages, and since all courses in this department will be omitted in the year 1909-10, those who are planning major work in this field should take courses in those subjects.

## 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.

II. HISTORY OF MEDIAEVAL AND MODERN ARCHITECTURE.—The evolution of the church from the early basilica to the fully developed Gothic style has special emphasis. Future tendencies in architecture and municipal art receive consideration. Second semester; 3 credit hours.

III. SCULPTURE OF THE RENAISSANCE.—A study of the sculpture of Italy in the fifteenth and sixteenth centuries. First semester; 3 credit hours.

IV. HISTORY OF THE PAINTING OF THE RENAISSANCE.—A study and comparison of the schools of Florence, Venice and Holland in the fifteenth, sixteenth and seventeenth centuries. Second semester; 3 credit hours.

V. HISTORY OF MODERN PAINTING.—A consideration of the classic, romantic, realistic and idealistic tendencies of the art of painting in the present age. First semester; 3 credit hours.

VI. THE STUDY AND APPRECIATION OF ART.—An introductory course in art criticism, dwelling upon the essential principles of fine art in architecture, sculpture and painting, with the intention of awakening interest and appreciation. Second semester; 3 credit hours.

## COURSES IN DRAWING, PAINTING AND DESIGN

I. BLACK AND WHITE WORK.—A course in charcoal, ink and wash, laying the foundations for pictorial drawing, and especially for illustration. First semester; 2 credit hours. To be given in 1910-11.

II. BLACK AND WHITE WORK.—A continuation of course I. Second semester; 2 credit hours. To be given in 1910-11.

III. WATER COLOR PAINTING.—Practical work in painting from still life, flowers and landscape. First semester; 2 credit hours. To be given in 1910-11.

IV. OIL PAINTING.—Practical work in painting from still life, flowers and landscape.

Second semester; 2 credit hours. To be given in 1910-11.

V. DESIGN.—The essential principles of design.

First semester; 2 credit hours. To be given in 1911-12.

VI. APPLIED DESIGN.—Applications in metal and leather.

Second semester; 2 credit hours. To be given in 1911-12.

## 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.

The Violin Department will be under the direction of Miss Hope Whitaker, who received her musical training from Mr. Henry Diamond (a Sevcik pupil), Mr. Olheiser and Mr. Emile Sauret. The Sevcik Method will be used, also studies by Kreutzer, Spohr, etc. Miss Whitaker will also teach Advanced Harmony, Counterpoint and Composition wherever desired.

Recitals are given by the department at least three times a 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 eight credits will 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 lesson 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;  $\frac{1}{2}$  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;  $\frac{1}{2}$  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;  $\frac{1}{2}$  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.

I 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 polynomials 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. **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., 10:30.

IV. MATHEMATICS (Solid Analytic Geometry, Calculus).—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 differential equations; infinite series including a brief treatment of Fourier's series and indeterminate forms, and complex numbers.

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

V. ANALYTIC MECHANICS.—Equivalence of force systems; center of gravity and centroid; attraction and stress; general principles of equilibrium and applications; rectilinear motion of a particle; curvilinear motion; motion of a rigid body. Prerequisite: Course III and course I in Physics.

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

VI. ANALYTIC MECHANICS.—This course is a continuation of course V and extends much of the work begun in that course. It also takes up such subjects as work and energy, impulse and momentum.

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

VII. MATHEMATICS (Differential Equations).—This course is a continuation of course IV. It covers the following subjects: 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. 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.

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

IX. HISTORY OF MATHEMATICS.—Outline of the history of mathematical discovery and the development of mathematical thought. Prerequisite: Course IV.

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

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

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

XI. 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.

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

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. ASTRONOMY.—A short course in theoretical and practical astronomy. A discussion of the solar system, including theories as to its origin and a mathematical treatment of the motions of the planets and the elements of elliptical orbits; the yearly and diurnal motion of the earth and the consequent apparent motion of the sun and stars; the celestial sphere, the ecliptic and equatorial circles, and the system of spherical coordinates; the astronomical triangle and its solutions; observations with the engineer's transit, including observations for latitude on Polaris at culmination and on the sun at noon, finding the true meridian by an observation on Polaris at elongation. A study of time, and the use of the Nautical Almanac. This course may be elected by students who have had Mathematics II, and is designed to meet the needs of students in Civil Engineering.

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

XIV. 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.

Second semester; 3 credit hours. Omitted in 1909-10.

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

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

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

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

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

First semester; 3 credit hours. Omitted in 1909-10.

XVIII. 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.

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

### 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

### COURSES IN GENERAL BIOLOGY

I and II. GENERAL BIOLOGY.—An introduction to the study of living things, designed to illustrate by the study of a few organisms the fundamental structure and properties of living matter.

Both semesters; 4 credit hours; Lect. T. Th., 10:30, Lab., two afternoons.

III. INVERTEBRATE ZOOLOGY.—A general course in the morphology and classification of Invertebrates. Dissection of typical Invertebrates.

First semester; 4 credit hours; Lect. T. Th., 8:30, Lab. time to be arranged.

IV. VERTEBRATE ZOOLOGY.—A continuation of course III. The dissections include *Balanoglossus*, *Amphioxus*, Trout, Frog, Cat, etc.

Second semester; 4 credit hours, Lect. T. Th., 8:30, Lab. time to be arranged.

VII. ORGANIC EVOLUTION.—This course is given conjointly by the departments of Biology, Geology and Psychology, and consists of a series of lectures with reference reading. Those entering the class will be expected to have had a year in Biology.

First semester; 2 credit hours; T. Th., 11:30. Omitted in 1909-10.

VIII. THE HUMAN BODY.—An advanced subject for mature students, requiring a good foundation in Biology, Chemistry and Physics. The work given will, in a general way, be similar to the course of study outlined in Martin's Advanced Course on the Human Body. In addition the skeleton and models will be studied, and outside readings assigned. The anatomy and physiology of the supporting tissues, motor tissues, nervous system, and metabolism in general will be considered.

Second semester; 4 credit hours; M. T. Th. F., 10:30.

IX. BACTERIOLOGY.—A general course, the discussion in the recitations following Newmann's and Fisher's Texts. The laboratory work will be conducted in the manner outlined in Frost's Manual.

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

X. ENTOMOLOGY.—A course in systematic entomology; a study of the anatomy and morphology of insects, followed by study of the different orders and families, with use of keys for determination of species. Comstock's Insect Life is the basis for the specific determinations. Special attention is given to injurious insects, with means employed for their control.

Second semester; 3 or 4 credit hours; T. Th., 8:30, Lab. time to be arranged.

XI and XII. 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 prerequisites for admission.

Both semesters; 2 credit hours; F., 1:30.

XIII. PHOTOGRAPHY.—A continuation of the preceding course. The student is taught how to make lantern plates, transparencies and bromide enlargements, copies of various subjects of different colors, and is given scientific objects to photograph. No attempt is made at portraiture.

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

XV and XVI. RESEARCH WORK.—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, and must have a reading knowledge of French and German.

Both semesters; 4 or 5 credit hours; T. Th., 9:30, and Lab. time to be arranged.

XVII and XVIII. 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; hours to be arranged.

XIX. BIOLOGICAL STATION.—In addition to the courses here offered students are referred to the description of the work of the Biological Station, carried on under the direction of the Professor of Biology. 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.

#### COURSES IN BOTANY AND FORESTRY.

I. GENERAL BOTANY, MORPHOLOGY.—A study of the form and structure of plants with reference to their systematic arrangement and relationships. Illustrated by typical members of the various groups.

First semester; 4 credit hours; Lect. M. F., 11:30, Lab. time to be arranged.

II. GENERAL BOTANY, PHYSIOLOGY.—This course will constitute with Morphology the continuous work of a year. It will deal with the relations of plants to temperature, moisture, light, etc.; with the composition of plants and their relation to the soil and air; also with the subjects of nutrition, growth, etc. Prerequisite: Botany I.

Second semester; 4 credit hours; Lect. M. F., 11:30, Lab. time to be arranged.

III. FOREST BOTANY, DENDROLOGY.—Lectures on forest trees, especially of the United States, illustrated with lantern slides and other material. Laboratory work on the structures and properties of woods. Field work on the local forests. Identification of trees. Collection of material. Prerequisite: Botany I and II.

First semester; 4 credits hours; Lect. M. W. F., 10:30, Lab. time to be arranged.

IV. FOREST BOTANY, SILVICULTURE.—A study of the relation of the distribution of forests to climatic factors. The development of forest dispersal and distribution of species. The relation of forests to matters of human interests, stream flow, erosion, sanitation, etc. The propagation of trees naturally and under cultivation. Lectures, laboratory and field work. Prerequisite: Botany I and II.

Second semester; 4 credit hours; M. W. F., 10:30, Lab. time to be arranged.

V. and VI. **SYSTEMATIC BOTANY**.—Collection and study of plants of the local flora, emphasizing relationships of genera and species. Lectures and discussions.

Both semesters; T. Th., 9:30, Lab. time to be arranged.

### GROUPING OF SUBJECTS FOR AN UNDERGRADUATE PRE-FORESTRY COURSE

The importance of training in Forestry directs special attention to this field in the University. Unusual advantages for such a development are presented by reason of the location of the headquarters of District No. 1 of the Forest Service in Missoula, and also by the proximity of large National Forests and private forest industries.

A thorough preparation for the profession of Forestry requires a liberal education in language, economics, psychology, mathematics, surveying, engineering, as well as the collateral sciences of geology, physics, chemistry and biology.

The following combination of subjects is suggested as a suitable program to meet the needs of students preparing to enter this profession.

PHYSICAL CULTURE . . . . .	2 hours
ENGLISH COMPOSITION . . . . .	4 hours
ECONOMICS . . . . .	6 hours
PSYCHOLOGY . . . . .	3 hours
GERMAN . . . . .	16 hours
MATHEMATICS . . . . .	16 hours
ENGINEERING . . . . .	20 hours
GEOLOGY . . . . .	10 hours
PHYSICS . . . . .	8 hours
CHEMISTRY . . . . .	8 hours
BIOLOGY . . . . .	12 hours
FORESTRY . . . . .	17 hours

### LECTURES IN FORESTRY

The following course of lectures on various phases of Forestry was given in the University during the academic year 1908-09 by the several officers of District No. 1, United States Forest Service:

1. The Development of Forestry in the United States,  
W. B. GREELEY, District Forester
2. The National Forest Policy,  
F. A. SILCOX, Assistant District Forester
3. The Management of National Forest Timber Lands; Estimates and Working Plans,  
A. W. COOPER, Chief of Silviculture

4. Management of National Forest Timber Lands; Timber Sales (Illustrated with the stereopticon),  
D. T. MASON, Assistant Chief of Silviculture
5. Tree Planting in the National Forests. (Illustrated with the stereopticon),  
E. C. CLIFFORD, Chief of Planting
6. Stock Grazing in the National Forests. (Illustrated with the stereopticon),  
F. A. SILCOX, Assistant District Forester
7. The Use of Public Lands in the National Forests,  
P. D. KELLETER, Chief of Occupancy
8. The Protection and Improvement of the National Forests. (Illustrated with the stereopticon).  
R. Y. STUART, Assistant Chief of Operations
9. The Organization of the Forest Service: Its Requirements and Opportunities,  
W. B. GREELEY, District Forester
10. National Forest and Public Land Laws,  
W. M. AIKEN, District Law Officer
11. State Forest Policies,  
W. M. AIKEN, District Law Officer
12. The Use and Preservation of Forest Products. (Illustrated with the stereopticon),  
F. I. ROCKWELL, Acting Chief of Products

### SHORT COURSE IN FORESTRY

By joint agreement with the United States Forest Service, a special short course in Forestry will be given at the University during January, February and March. This short course will meet the special needs of forest rangers already in the Service, but will be 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 will be Dendrology, Silviculture, Forest Management, Surveying and Mapping, Geology and Mineralogy, Lumbering, Measurements, Timber Sales and Planting, Grazing, Office Administration. Lectures, laboratory practice and field demonstrations, will be given.

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

Admission to this Special Short Course in Forestry may be 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 will be 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.

January 4 will be the opening day of the course, and if possible registration should be made not later than that day.

## BIOLOGICAL STATION

The work of the Station this year begins Wednesday, July 14, and continues four weeks, or until Thursday, August 12. There will be no special courses offered. 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 this summer camp 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.

The laboratory is a one-story frame structure, 18x24, containing a small store room, a dark room, and tables for twelve students. It is substantially built, well-lighted, and suited to outdoor work. 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 ten summers has been occupied from June until September or October. During this time some fifteen states have been represented, and the Station has become well known to many American naturalists.

The present site of the Station, on Swan River near its outlet into Flathead Lake, was chosen because of its many advantages, in the midst of a combination of lakes, rivers, mountains, forests, at elevations from 3,000 to 10,000 feet, such as one will find in few places in America. There is an abundance of new material to be had because the field is unexplored. The climate is favorable, for it seldom rains in July and August,

so that long trips may be planned without fear of exposure.

The postoffice is Bigfork. This village has daily mail, telephone, electric light, stores, a hotel, restaurants, and many dwellings. It is seventeen miles from Kalispell, and is easy of access either by boat or mail stage from Kalispell, or from Ravalli by stage and boat.

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. All inquiries should be addressed to the Director, Morton J. Elrod, Missoula, Montana.

## PHYSICS AND GEOLOGY

### MAJOR REQUIREMENTS

Students desiring to do special work in Physics must take several courses in Mathematics.

For those who make Geology their major subject courses in Biology, Physics and Chemistry, will be required.

Students wishing to specialize in Mineralogy should elect at least two years of work in Chemistry.

### COURSES IN PHYSICS

I. MECHANICS AND HEAT.—Required of all students in Engineering. Must be preceded by preparatory Physics and Mathematics I and II. Text, Edser's Heat for Advanced Students. Laboratory, Millikan's Mechanics, Molecular Physics and Heat.

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

II. MAGNETISM, ELECTRICITY, SOUND AND LIGHT.—A continuation of course I. Text, Thompson's Elements of Electricity and Magnetism. Laboratory, Millikan and Mills.

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

III or IV. LIGHT.—Primarily a laboratory course. A few lectures will be given on past and present theories of light and on the manipulation of apparatus. Must be preceded by courses I and II. Preston on the Theory of Light will be used.

First or second semester; 2 credit hours; Lect. T., 9:30, Lab. M. W.

V or VI. SOUND.—A careful study of the subject of Sound by both lectures and laboratory work. Must be preceded by courses I and II.

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

VII or VIII. HEAT.—A laboratory and reading course. Must be preceded by courses I and II. The Theory of Heat by Preston will be the main text used.

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

IX or X. ADVANCED EXPERIMENTAL PHYSICS.—This course must be preceded by Physics I, II, III, V and VII, and by Mathematics I, II, III and IV.

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

XII. ELECTRICAL MEASUREMENTS.—Primarily a laboratory course. Must be preceded by courses I and II. A knowledge of calculus is required. Text, Carhart and Patterson's Electrical Measurements.

Second semester; 4 credit hours; Lect. M., 10:30, Lab. W. F.

### 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, fossils, minerals and rocks from many localities. It is intended to be largely a cultural course, and is open to all students. Text, Scott, An Introduction to Geology.

First semester; 3 credit hours; Lect. T. Th., 8:30, Lab. to be arranged.

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; 3 credit hours; Lect. M. W., 10:30, Lab. M.

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.

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

VII or VIII. 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 or second semester; 2 or 4 credit hours; time to be arranged.

X. 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.

## COURSES IN MINERALOGY, ECONOMIC GEOLOGY

XI or XII. PHYSICAL MINERALOGY (ELEMENTARY CRYSTALLOGRAPHY AND PHYSICAL MINERALOGY).—A study of the elements of crystallography and the identification, by means of physical characters and chemical tests, of 125 common minerals. Text, Rowe's Elements of Crystallography and Mineralogy.

First or second semester; 4 credit hours; Lect. T. Th., Lab. T. Th., time to be arranged.

XIV. 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.

Second semester; 2 or 4 credit hours; Lab. T. Th. S.

XV. ADVANCED MINERALOGY.—The determination and study of minerals as to their origin, locality, uses, etc.

Credit and time to be arranged.

XVI. 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.

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

XVII. ADVANCED ECONOMIC GEOLOGY.—Special work on special subjects.

Credit and time to be arranged.

XIX or XX. 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.

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

## CHEMISTRY

### MAJOR REQUIREMENTS

Students wishing to take Chemistry as major subject will be required to take the following courses:

General Chemistry, 8 hours; Qualitative Analysis, 5 hours; Quantitative Analysis, 5 hours; Organic Chemistry, 8 hours; Physical Chemistry, 4 hours.

Supplementary courses should be taken as follows: English, I and II; German, I, II, III, IV; Mathematics, I, II, III, IV.

## FOUNDATION COURSES IN CHEMISTRY

I and II. **GENERAL CHEMISTRY.**—A study of the fundamental laws of Chemistry and of the properties and 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. M. W. and T. Th., 1:30.

III. **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.

First semester; 5 credit hours; Lect. T. Th., 10:30, Lab. M. W. F., 1:30.

IV. **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. Prerequisites, courses I, II, and III.

Second semester; 5 credit hours; Lect. T. Th., 10:30, Lab. M. W. F., 1:30.

## COURSES IN ORGANIC CHEMISTRY

VI and VII. **ORGANIC CHEMISTRY.**—A study of the carbon compounds with reference to their properties and constitution, special attention being given to such matters as saturation, polymerization, structural formulae and stereo-isomerism. Prerequisites: Courses I, II, and III.

Both semesters; 4 credit hours; Lect. and Lab., time to be arranged.

VIII. **ADVANCED ORGANIC CHEMISTRY.**—A consideration of special topics and a study of research in organic chemistry.

2 credit hours; Lect. and Lab., time to be arranged.

IX. **ORGANIC PREPARATIONS.**—Special topics to be studied. Credit and time to be arranged.

## COURSES IN PHYSICAL CHEMISTRY

XI and XII. **PHYSICAL CHEMISTRY.**—In this course a study is made of the physical laws underlying the science of chemistry. A knowledge of calculus is required.

Both semesters; credit and time to be arranged.

XIII and XIV. **PHYSICAL CHEMISTRY, LABORATORY.**—

Both semesters; credit and time to be arranged.

XV. **ADVANCED PHYSICAL CHEMISTRY.**—

Credit and time to be arranged.

XVI. **ELECTRO-CHEMISTRY.**—

Credit and time to be arranged.

## COURSES IN ANALYTICAL AND APPLIED CHEMISTRY

XVII. **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 or courses I and II.

2 credit hours; time to be arranged.

XVIII. FOOD ANALYSIS.—Open to those who have had course IV.

Credit and time to be arranged.

XIX. ADVANCED QUANTITATIVE ANALYSIS.—A continuation of course IV.

Credit and time to be arranged.

XX. ORGANIC ANALYSIS.—Analysis of organic bodies. Course IV is a prerequisite.

Credit and time to be arranged.

XXI. TECHNICAL ANALYSIS.—Analysis of such bodies as are met with in commercial analysis. Course IV is a prerequisite.

Credit and time to be arranged.

XXII. INDUSTRIAL CHEMISTRY.—A study of the chemistry involved in various manufacturing processes. Open to those having had courses I and II.

3 credit hours; time to be arranged.

XXIII. 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 course IV.

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

XXIV and XXV. RESEARCH.—Research in Analytical, Physical, or Applied Chemistry. Open to students properly prepared. Special courses in Inorganic Preparations, Physiological Chemistry, Chemistry of Photography and Metallurgy may be given to those desiring such work.

Both semesters; credit and time to be arranged.

#### COURSE IN CHEMICAL ENGINEERING

The 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 will be paid to that subject. For different lines of work requiring different preparation the student will be allowed optional work. Students graduating from this course find employment as analysts, 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 following outline, descriptions in the various departments should be consulted. Students will be expected to adhere substantially to the outline, but they may be allowed a limited amount of substitutions.

## FIRST YEAR

First Semester	Hrs.	Second Semester	Hrs.
Mathematics I .....	5	Mathematics II .....	5
Chemistry I .....	4	Chemistry II .....	4
Mechanical Drawing .....	2	Mechanical Drawing .....	2
English I .....	2	English II .....	2
Geology I .....	3	Geology II .....	3

## SECOND YEAR

First Semester	Hrs.	Second Semester	Hrs.
Mathematics III .....	5	Analytic Mechanics .....	2
Qualitative Analysis .....	5	Quantitative Analysis .....	5
Physics I .....	4	Physics II .....	4
Descriptive Geometry .....	2	Descriptive Geometry .....	2

## THIRD YEAR

First Semester	Hrs.	Second Semester	Hrs.
Analytic Mechanics .....	4	Analytic Mechanics .....	2
Electrical Measurements.....	2	Electro-Chemistry .....	2
Organic Chemistry .....	4	Organic Chemistry .....	4
Quantitative Analysis .....	2	Quantitative Analysis .....	2
Engineering Drawing .....	2	Engineering Drawing .....	2
Mechanism .....	2	Mineralogy .....	4

## FOURTH YEAR

First Semester	Hrs.	Second Semester	Hrs.
Thermodynamics .....	3	Hydraulics .....	3
Hydraulics .....	3	Metallurgy .....	3
Physical Chemistry .....	3	Physical Chemistry .....	3
Industrial Chemistry .....	4	Assaying .....	3
Machine Design .....	2	Optional .....	4

## 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 35]. 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 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 shop is 30x40 feet in size, and is lighted from opposite sides. There are ten 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 four 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.

Opening off the machine and forge shops is the foundry. It is 30x30 feet in size and well lighted by windows 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.

In the basement a 50-horsepower automatic Atlas engine 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-kilowatt direct-current generator, an interpole variable speed direct-current motor, transformers, storage batteries, etc., and other instruments necessary for making electrical tests.

For field work in surveying there is an excellent equipment, consisting of transits, levels, compasses, solar attachments, rods, chains, tapes, etc.

#### 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.

I 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. **ENGINEERING SURVEYING.**—A course of two lectures and three afternoons a week for office and field work, devoted to those branches of surveying with which the general engineer comes in contact. 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; railroad curves; earthwork slope staking and computations; the use of the slide-rule and the planimeter. Prerequisite: Mathematics II.

Second semester; 4 credit hours; Lect. T. Th., 1:30; Field and Drawing, M. W. F., 1:30.

III b. **ADVANCED SURVEYING.**—A course of field work, computation and drawing, with occasional lectures and recitations, continuing the work of course III a, and in addition: the use of the compass, 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.

First 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.

Second semester; 2 credit hours; M. W. F., 9:30.

IV b. **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.  
First semester; 4 credit hours; M. T. Th. F., 11:30.

V b. MECHANICS.—The same as Mathematics VI, which see.  
Second semester; 2 credit hours; T. F., 11:30.

V c. STRENGTH 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; the physical properties of iron, steel, cement, concrete and timber; the testing of materials. Prerequisite: Engineering V a.

Second semester; 3 credit hours; M. W. F., 8:30-10:30.

## 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 traction; electric illumination and heating; distribution and wiring; storage batteries. Prerequisite: Engineering VI a.

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

VI c. 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. DYNAMO DESIGN.—Lectures, computation, and drawing. Each student makes the complete design and working drawings for a generator or motor. Prerequisite: Engineering VI c.

Second semester; 2 credit hours; W. F., 1:30.

### COURSES IN STEAM 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. ELEMENTARY STEAM AND GAS ENGINEERING.—The steam engine indicator; governing; action of the fly wheel and inertia effects of reciprocating parts; air pumps, condensers and other power plant accessories; gas and oil engines; pumps and pumping machinery. Prerequisites: Engineering VII a and V a.

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

VII c. THERMODYNAMICS OF THE STEAM ENGINE.—Thermal capacities; the laws of thermodynamics; perfect gases; thermal lines; entropy; saturated steam; superheated steam; applications to the steam engine and accessories; compound engines; testing steam engines; compressors; the flow of steam; injectors; steam turbines. Prerequisite: Engineering VII b.

First 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., 10:30.

### 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.

First semester; 2 credit hours; T. Th., 8:30-10:30.

VIII b. HYDRAULIC MOTORS.—The dynamic pressure of water; impulse and reaction; water hammer; a study of the various forms of water wheels and turbines; the design of a Doble impulse wheel and a Francis turbine; regulation; tests; the centrifugal pump. Prerequisite: Engineering VIII a.

Second semester; 2 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. WATER SUPPLY AND SEWERAGE.—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 system; cast iron, steel and wooden pipes. Combined and separate sewerage systems; amount of house sewage and storm water; flow in sewers; size and shape of sewers;

flushing and ventilation; design of sewers and sewerage system; the problem of sewage disposal and purification. Prerequisite: Engineering VIII a.

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

VIII e. STREAM FLOW MEASUREMENTS.—A study of stream flow and the method of measuring it, with actual practice in the field. The use of floats and current meters in measuring velocity; vertical velocity curves; slope measurements and the use of Kutter's formula; velocity-area stations; soundings; gagings; methods of computing discharge; area, velocity and discharge curves; the scientific use of stream flow data in making estimates for water power development.

First semester; 1 credit hour; time to be arranged.

VIII f. HYDRAULIC DESIGN.—The design of a high masonry dam by the graphical method. The design of a sewerage system, pipe line, or water supply pipe system. This course is to be taken simultaneously with course VIII d. Prerequisite: Engineering VIII a and X a.

Second semester; 1 credit hour; time to be arranged.

### COURSES IN RAILROAD ENGINEERING

IX a. RAILROAD ENGINEERING.—The student will have had in Engineering III a practice in laying out curves in the field, and in staking out and computing earthwork. In this course there will be taken up a more comprehensive study of curves and earthwork as well as some of the more technical features of railroad engineering. Easement curves; the preparation and use of the "mass diagram" for the determination of questions of "haul" and of "borrow and waste;" maintenance of way; the economics of railroad location, with a study of train resistance, grade and curvature; signals; yards and stations; tunnels; electric railroads. Prerequisite: Engineering III b.

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

IX b. 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. THE THEORY OF BRIDGES AND OTHER STRUCTURES.—The application of the principles of mechanics and strength of materials to the design of simple engineering structures. Loads, reactions and internal stresses; maximum shear and bending moment with movable loads; wooden beams; the plate girder; roof trusses; simple bridge trusses; the reinforced concrete beam; dams and retaining walls; the theory of earth pressure; foundations. Prerequisite: Engineering V c.

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

X b. 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.



Xc. **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.

### ENGINEERING LABORATORY COURSES

XI a. **ENGINEERING LABORATORY.**—Tests of steam engines and pumps; calorimetry; tests on the flow of water; mechanical tests on cast iron, wrought iron, steel and timber. To be taken simultaneously with Engineering VI c and VIII a.

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

XI b. **ENGINEERING LABORATORY.**—Tests of generators, motors, transformers, etc., for students in Electrical Engineering. Hydraulic measurement and cement testing for students in Civil Engineering. Prerequisite: Engineering XI a.

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

### 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; 2 credit hours; 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.

Second semester; 1 credit hour; time to be arranged.

### 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, 1908-09

Name	Group and Credits	Home Address
Allen, Carrie	Literary—91	Livingston
Anderson, Frances	Literary—29	Missoula
Andrews, Almada	Classical—130	Missoula
Averill, Florence H.	Literary—73	Townsend
Baker, Leo W.	Engineering—31½	Missoula
Barbour, Atha	Classical—29½	Big Timber
Beavers, Geo.	Scientific, Technical Chemistry—132½	Fort Wayne, Ind.
Bennett, Wm. A.	Literary—52½	Anaconda
Berry, Marguerite	Scientific—39	Missoula
Bird, Dorothy Frances	Literary—10	Lo Lo
Bishop, Arthur Fowler	Scientific, Forestry—91	Seattle
Black, Sylvia	Classical—29½	Whitehall
Bonner, Frank Edward	Engineering—77	Missoula
Bradford, Bess Margaret	Literary—130½	Missoula
Buck, Clarence Henry	Irregular, Engineering—28	Stevensville
Buck, Fred Sybrandt	Irregular, Engineering—18	Stevensville
Bullerdick, Millard Sidney	Literary—51½	Sheridan
Burke, Mary Elizabeth	Classical—110	Missoula
Buswell, Dera Montana	Literary—131	Missoula
Butzerin, Anna Hazel	Classical—96½	Missoula
Catlin, Florence Elizabeth	Literary—101	Anaconda
Clanton, Mamie	Scientific—77½	Billings
Clanton, Willie	Scientific—47	Billings
Coffee, Eva	Scientific—59½	Missoula
Conlon, Mary F.	Literary—5½	Lo Lo
Conner, Daniel Marion	Special, Engineering—27½	Darby
Cordz, Effie	Scientific—101	Missoula
Craig, Vincent Stuart	Scientific, Graduate	Missoula
Cronk, Opal May	Classical—93	Townsend
Cunningham, Ida May	Literary—131	Missoula
De Ryke, Florence	Literary—49	Missoula
Deuel, Homer Roswell	Engineering—75½	Missoula
Dingwall, James Alexander	Engineering—54½	New Chicago
Dinsmore, Oliver Raymond	Engineering—56	Missoula
Dorman, Fenwick Gilbert	Irregular, Engineering—10½	Missoula
Durfee, Amelia Eulalie	Classical—56½	Philipsburg
Dwyer, Ceciel Katherine	Literary—133	Missoula
Eggleston, Charles Little	Irregular—4	Anaconda
Eidell, Isma Caroline	Literary—81	Helena
Elrod, Mary Josephine	Scientific—96½	Missoula
Farmer, Charles Frederick	Engineering—140½	Missoula
Forbis, Clarence Jenks	Engineering—78½	Missoula
Forbis, Hugh Temple	Engineering—83	Missoula
Foster, Fay	Literary—41½	Missoula
Foster, Frances Folsom	Literary—95	Great Falls
Fox, Edna Theresa	Literary—98½	Twin Bridges
Fredell, Ernest W.	Engineering—75½	Anaconda
Freaser, Marie Sophie	Scientific—130½	Helena

Name	Group and Credits	Home Address
Friday, Richard Cort W.	Engineering	Sigourney, Iowa
Garman, Thomas Lytle	Scientific, Chemical Engineering	Oak Park, Ill.
Gleason, Frank Elliott	Engineering—64½	Florence
Gough, Nina Pearl	Literary—32	Missoula
Graham, Dorothy Mary	Classical—109½	Livingston
Green, Dorothy Dean	Classical—31	Helena
Greenwood, Frederick	Literary—139	Spokane
Haley, Essie Mae	Classical—73½	Stevensville
Hamilton, Ray Webster	Engineering—24	Missoula
Hanson, Mary	Literary—61½	Missoula
Hanson, Peter Emil	Preparatory	Missoula
Henderson, Mary Josephine	Literary—102	Hall
Henderson, Renee Jane	Literary—101	Hall
Hoffman, Charles Henry	Engineering—68	Glasgow
Hogan, George Elmer	Special, Engineering—38	Anaconda
Hollensteiner, Edna Frances	Classical—100	Lo Lo
Hughes, Ethel Grace	Literary—77	Missoula
Hunter, Birdie Florence	Classical—30	Missoula
Irwin, Bessie	Literary—29	Lo Lo
Johnson, John Charles	Engineering—69½	Missoula
Johnson, Laura Searight	Literary—95	Great Falls
Johnson, Maude	Literary—29	Missoula
Johnson, Richard Leon	Preparatory	Missoula
Jones, James	Engineering—7½	Athlone, Ireland
Kitt, Berney Fred	Engineering—142	Missoula
Kramer, Cecil Inice	Literary—33	Missoula
Leaf, Lizzie Beulah	Classical—94	Missoula
Leech, Arbie Eugene	Literary—109½	Choteau
Leech, Florence Mary	Classical—34	Choteau
Lewis, Frank	Engineering—140	Missoula
Lewis, Nellie Ray	Special, Literary—25	Missoula
Line, Robert Campbell	Literary—111	Columbus
Little, George Daniel	Scientific—79	Missoula
Lovett, Ernest Kennedy	Engineering—51½	Miles City
Lovett, Olive	Classical—81	Miles City
Lucy, Abbie Catherine	Literary—59	Missoula
Lucy, Margaret Mary	Literary—80½	Missoula
Lynch, Agatha May	Literary—24	Plains
Lyng, Jennie Marguerite	Literary—143	Highwood
Maclay, David Lamar	Scientific—96	Lo Lo
Maclay, Holmes	Engineering—48½	Lo Lo
Maclay, Harry David	Engineering—65½	Lo Lo
McC Campbell, Margaret Olivia	Classical—32½	Billings
McCormick, Maude Frances	Literary, Graduate	Hardin, Mo.
McCowan, Charles Stuart	Literary—81½	Great Falls
McCullough, Massey Sanderson	Scientific—91	Missoula
McCullough, Maude Brooks	Literary—25	Missoula
McFarlane, Gertrude Cornelia	Irregular, Literary—17	Whitefish
McGregor, Donald B.	Scientific, Forestry—38	Missoula
MacGregor, Mildred Alene	Literary—105	Hinsdale
MacRay, Warren Campbell	Engineering—27	Missoula
McLaren, Gilbert Drake	Scientific—130	Hamilton
McLean, Gladys Ann	Literary—72	Anaconda
McLeod, Walter Herbert	Literary—85	Missoula

Name	Group and Credits	Home Address
Marcum, Ethel Catherine	Literary—31	Helena
Marshall, Mary Lucile	Literary—66	Missoula
Martindale, Bess	Literary—36	Litchfield, Minn.
Mason, Marjorie Estelle	Classical—102	Missoula
Mason, Milton	Engineering—34	Missoula
Metcalf, Helen Frances	Irregular, Literary—19	Stevensville
Morris, Wesley Warren	Engineering	Anaconda
Montgomery, Ewing F.	Engineering—61	Anaconda
Nichols, Nora	Literary—14	Missoula
Northey, Beatrice	Literary—32	Missoula
O'Rourke, Arthur William	Literary—32	East Helena
Penman, Daisy Marjory	Literary—111	Columbus
Pratt, Edna Crete	Literary—130	Hebron, Nebr.
Preusse, Arnold Bismark	Special, Engineering	Spokane, Wash.
Putney, Emma Marion	Literary—26	Missoula
Rankin, Grace Evelyn	Classical—22	Missoula
Rankin, Mary Frances	Literary—131½	Missoula
Reardon, Stephen James	Engineering—41	Boston, Mass.
Reed, Hulda Theresa	Irregular, Scientific—19	Butte
Reid, Milton A.	Engineering	Anaconda
Richards, David Dudley	Scientific—32½	Butte
Robertson, Annabelle	Classical—77	Hamilton
Robertson, Cordelia	Irregular	Bozeman
Rolfe, Mary Edith	Literary—71	Monarch
Romney, Winifred Lois	Literary—17½	Hamilton
Ronan, Peter	Irregular	Missoula
Rosean, Edna Pearl	Literary—98½	Columbus
Ross, Anabel	Literary—97	Missoula
Ross, Marjorie Lee	Literary—66½	Missoula
Ryan, Elsie Jeannette	Special, Literary—15	Dupuyer
Ryan, William Emmett	Engineering—60½	Dupuyer
Satterthwaite, Hugh Sumner	Preparatory	Iron Mountain
Satterthwaite, Roberta Lee	Literary—90½	Iron Mountain
Savage, Azelia Agnes	Literary—34	Missoula
Schmit, Joseph Michael	Irregular, Engineering—12	Helena
Shull, Zona May	Special, Literary—65	Missoula
Shunk, Shirly Belle	Literary—32	Missoula
Silloway, Herbert William	Literary—51	Lewistown
Simpson, James Carlisle	Literary	Spokane, Wash.
Simpson, Morton Dixon	Engineering—70½	Stevensville
Sleeman, Florence Josephine	Irregular, Literary—20	Stevensville
Sloane, Frank Harold	Engineering—51½	Missoula
Smead, William Burton	Engineering—17	Missoula
Smith, Ralph Wallace	Engineering—54	Missoula
Soderstrum, John P.	Engineering—10	Clinton, Ia.
Spencer, George Harvey	Scientific—61	White Sulphur
Spencer, Roy Hascall	Special, Forestry	White Sulphur
Steele, Edith Mary	Literary—75	Billings
Stillinger, Beatrice May	Classical—47½	Iron Mountain
Stoddard, Fred Thayer	Engineering—92	Missoula
Stone, George Putnam	Literary—5	Missoula
Swenson, Knute Emil	Classical—84	Missoula
Tait, William James	Engineering—95	Missoula
Taylor, John Baker	Scientific, Forestry—21	Missoula

Thieme, Florence Ethela .....	Classical—131 .....	Missoula
Thieme, Fred Ernest .....	Engineering—40 .....	Missoula
Thieme, Warren Ernest .....	Scientific—26 .....	Missoula
Toole, Thula .....	Special, Literary .....	Missoula
Torrey, Henry Pierce .....	Special, Literary .....	Manila, P. I.
Van Eman, William Montgomery.....	Engineering—141 .....	Augusta
Van Engelen, Beulah .....	Literary—37½ .....	Missoula
Vealey, Charles Edward .....	Literary—12½ .....	Missoula
Vealey, William D. ....	Preparatory .....	Missoula
Vivian, Nan Kelsall .....	Literary—26 .....	Butte
Warren, DeWitt Cregier .....	Literary—57 .....	Chicago, Ill.
Wear, Helen Adelaide .....	Literary—34 .....	Helena
Webster, Fred C. ....	Preparatory .....	Missoula
Webster, Lucy .....	Preparatory .....	Missoula
Wharton, Carolina Pack .....	Classical—32 .....	Butte
Whipple, Gertrude Aletta .....	Literary—38 .....	Townsend
Whitaker, Helen Margaret .....	Literary—111 .....	Missoula
Whitaker, Jocelyn Alfred .....	Engineering—65½ .....	Missoula
Whitaker, Lucy Dora Alexandria.....	Literary—67 .....	Missoula
Wilkins, Ruth Bernice .....	Literary—25 .....	Missoula
Wilkinson, Ethel Marion .....	Special, Literary—30.....	Missoula
Williams, Lillian .....	Literary—82 .....	Deer Lodge
Williams, May .....	Special, Art—14 .....	Missoula
Winnihoff, Wilford Joseph .....	Scientific, Technical Chem- istry—111 .....	Philipsburg
Winstanley, Edward Alexander.....	Scientific, Chemical Engi- neering—32 .....	Missoula
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Wright, Ida Fayette .....	Classical—33 .....	Butte

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**Note.**—The above statement does not include special pupils in Music or students taking summer work in the Biological Station.

## THE ALUMNI OF THE UNIVERSITY

## OFFICERS OF THE ALUMNI ASSOCIATION

President . . . . .	Joseph W. Streit, 1907
Vice President . . . . .	Guy Sheridan, 1902
Secretary . . . . .	J. B. Speer, 1908
Treasurer . . . . .	C. E. Simons, 1905
Member Athletic Committee of A. S. U. M. . . . .	J. H. Bonner, 1907
Member Oratorical Committee of A. S. U. M. . . . .	Nell C. Bullard, 1908
Member Debating Committee of A. S. U. M. . . . .	Mrs. W. O. Dickinson, 1905
Members Executive Committee of A. S. U. M. . . . .	Gertrude Buckhouse, 1900; J. B. Speer, 1908

## REGISTER OF ALUMNI

## 1898

Mrs. Ella Robb Glenny, B. A. . . . .	Livingston, Montana
Miss Eloise Knowles, B. Ph. . . . .	18 Kelly Hall, University of Chicago, Chicago, Illinois

## 1899

Zoe Bellew, B. A., M. A. (Mrs. Sidney M. Ward) . . . . .	Hamilton, Montana
Earl Douglas, M. S. . . . .	Pittsburg, Pa.
Anna Louise Hatheway, B. A. (Mrs. Wm. D. Harkins) . . . . .	Missoula, Montana
George Hemstead Kennett, B. S. (M. D. Rush Medical College) . . . . .	Wardner, Idaho
Helen McCrackin, B. A. (M. A. University of Chicago) . . . . .	Hamilton, Montana
Charles Pixley, B. S. (M. D. Rush Medical College) . . . . .	Missoula, Montana

## 1900

Charles Earl Avery, B. Ph. . . . .	Missoula, Montana
Gertrude Buckhouse, B. S. . . . .	Missoula, Montana
Caroline Harrington Cronkrite, B. S. (Mrs. C. H. DeWitt H. Grubbs) . . . . .	Fort Missoula, Montana
Lu Knowles, B. S. (Mrs. R. J. Maxey) . . . . .	Madison Barracks, New York
Eben Murray, B. A. . . . .	Victor, Montana
Percey Shelley Rennick, B. A. (M. D., Kentucky Medical College) . . . . .	Fairview, Oklahoma
Sidney Elery Walker, B. S. (LL. B., Michigan) . . . . .	Fairview, Oklahoma

## 1901

Estelle Bovee, B. Ph. . . . .	Cedar Mountain, Montana
Hugh Graham, B. S. . . . .	1525 Mission St., San Francisco, Cal.
Sue Lewis, B. A. (Mrs. W. A. Thompson) . . . . .	East St. Louis, Ill.
Mary Lewis, B. A. (Mrs. W. B. Simpson) . . . . .	Leavenworth, Washington
Lydia Jimmie Mills, B. S. (Mrs. C. H. Rittenour) . . . . .	Plains, Montana
Bertha Simpson, B. Ph. . . . .	Missoula, Montana
Sidney Mire Ward, B. Ph. . . . .	Hamilton, Montana
George Cutler Westby, B. S. (M. E.) . . . . .	McGill, Nevada
Kathryn Wilson, B. Ph. . . . .	Spokane, Washington

## 1902

- Frederick Anderson, B. S. (M. E.) . . . . . Wallace, Idaho  
 George Barnes, B. A. (Classical) (D. D. Oxford University) . . . . . Coldwater, Michigan  
 Harold Blake, B. S. . . . . Spanish Claims Commission, Washington, D. C.  
 William O. Craig, B. S. . . . . Helena, Montana  
 Helene Kennett, B. A. (Literary) . . . . . Missoula, Montana  
 Helena La Caff, B. A. (Classical) (Mrs. Roy Jackson) . . . . . Florence, Montana  
 Agnes McDonald, B. A. (Classical) . . . . . Anaconda, Montana  
 Homer McDonald, B. S. . . . . Great Falls, Montana  
 Grant McGregor, B. S. . . . . Tooele, Utah  
 Fanny Maley, B. A. (Literary) . . . . . Missoula, Montana  
 Helen McPhail, B. A. (Classical) . . . . . New Chicago, Montana  
 Jeannette Rankin, B. S. . . . . Missoula, Montana  
 Katherine Ronan, B. A. (Classical) (Mrs. Trask) . . . . . Bingham Canyon, Idaho  
 Margaret Ronan, B. A. (Classical) . . . . . Missoula, Montana  
 Pearl Scott, B. A. (Classical) . . . . . Philipsburg, Montana  
 Guy E. Sheridan, B. S. . . . . Butte, Montana  
 Benjamin Stewart, B. S. . . . . Wallace, Idaho  
 Edith Watson, B. A. (Classical) (Mrs. C. H. Keel), . . . . . Red Lodge, Montana

## 1903

- Mrs. Charles E. Avery, B. A. (Classical) . . . . . Missoula, Montana  
 Miriam Hatheway, B. A. (Classical) . . . . . Missoula, Montana  
 Mabel Jones, B. A. (Literary) . . . . . Missoula, Montana  
 Martin Jones, B. S. . . . . Philippines  
 Lillian F. Jordan, B. A. (Literary) (Mrs. T. L. Bendon) . . . . . Tokna, Montana  
 Rella Likes, B. A. (Literary) . . . . . Missoula, Montana  
 Lucy Likes, B. A. (Literary) . . . . . Missoula, Montana  
 Claude O. Marcey, B. A. (Literary) . . . . . Forsyth, Montana  
 Ida G. Rigby, B. A. (Literary) (Deceased, February 19, 1904)  
 Eloise Rigby, B. S. . . . . Carlton, Montana  
 Wellington Rankin, B. S. . . . . Harvard University, Cambridge, Mass.  
 Harriet L. Rankin, B. A. (Classical) (Mrs. Oscar Sedman) . . . . . Murray, Idaho  
 Leslie Sheridan, B. S. (In M. E.) . . . . . McGill, Nevada

## 1904

- Page Bunker, A. B. (Classical) . . . . . Kalispell, Montana  
 Moncure Cockrell, A. B. (Classical) . . . . . Deer Lodge, Montana  
 George Greenwood, A. B. (Classical) (M. A. Dartmouth College) . . . . . 1724 8th Ave., Spokane, Washington  
 Walter Hammer, A. B. (Literary) . . . . . Billings, Montana  
 Alice Herr, A. B. (Literary) . . . . . Dillon, Montana  
 Roxy Howell, A. B. (Classical) . . . . . Butte, Montana  
 Georgia Evelyn Polleys, A. B. (Literary) . . . . . 927 S. 17th St., Lincoln, Nebraska

## 1905

- Jessie May Bishop, B. A. (Literary) (Mrs. E. P. Giboney) . . . . . Great Falls, Montana  
 Anna Carter, B. S. . . . . Missoula, Montana  
 William Oren Dickinson, B. S. . . . . Missoula, Montana  
 Alice Gertrude Glancy, B. A. (Literary) . . . . . Box 334, Lewistown, Montana  
 Herbert Hughes, B. S. (Ph. G., Chicago School of Pharmacy) . . . . .  
 6112 Knisback Ave., Chicago, Illinois  
 John Ray Haywood, B. S. (In Engineering) . . . . . Smelter, Nevada  
 Avery Faulkner May, B. A. (Classical) (Mrs. W. O. Dickinson) . . . . .  
 Missoula, Montana  
 Charles Edward Schoonover, B. A. (Classical) (Deceased).  
 Frances W. Sibley, B. A. (Literary) . . . . . Long Beach, California  
 Charles Edward Simons, B. A. (Classical) . . . . . Missoula, Montana  
 Blanche May Simpson, B. A. (Literary) . . . . . Missoula, Montana  
 Ray Epperson Walters, B. A. (Literary) . . . . .  
 Camp Columbia, Morris, Connecticut  
 Edward Williams, B. A. (Classical) . . . . .

## 1906

- Fred Elliot Buck, B. S. (In M. E.) . . . . . Missoula, Montana  
 Joseph Buckhouse, B. S. (In M. E.) . . . . . Glasgow, Montana  
 Maud Burns, B. A. . . . . Missoula, Montana  
 Elmer Reed Corbin, B. S. (In M. E.) . . . . .  
 1817 Santa Monica Ave., Los Angeles, California  
 Mary Evans, B. A. . . . . Livingston, Montana  
 Grace Serena Flynn, B. A. . . . . Missoula, Montana  
 Thomas Leo Greenough, B. S. (In M. E.) . . . . . Mullan, Idaho  
 Delbert I. Grush, B. S. (In M. E.) . . . . . Anaconda, Montana  
 Florence Matilda Johnson, B. S. (Mrs. J. J. Moon) . . . . .  
 5509 Greenwood Ave, Chicago, Illinois  
 Floyd Hardenburgh, B. S. . . . . Missoula, Montana  
 Maud Esther Johnson, B. A. . . . . 5509 Greenwood Ave., Chicago, Illinois  
 John Davis Jones, B. A. . . . . Forest Service, Hot Springs, California  
 Roy Daniel McPhail, B. A. . . . . New Chicago, Montana  
 Fay Abernathy Murray, B. A. (Mrs. Gilley) . . . . . Butte, Montana  
 Alma Lottie Myers, B. A. . . . . Missoula, Montana  
 Josie May Robb, B. A. . . . . Hamilton, Montana  
 Ona Mansfield Sloane, B. A. . . . . Missoula, Montana  
 Thomas Claude Spaulding, B. S. . . . . Forest Service, Missoula, Montana  
 Margaret Summers, B. A. . . . . Missoula, Montana  
 Ruth Ward, B. A. (Mrs. D. I. Grush) . . . . . Anaconda, Montana  
 Deborah Wagy, B. A. . . . . Stevensville, Montana

## 1907

- Cora Averill, B. A. (Classical) (Mrs. N. S. Poole) . . . . . Joliette, Montana  
 James Henry Bonner, B. S. (In Engineering) . . . . . Missoula, Montana  
 Charles P. Cotter, B. A. (Literary) . . . . .  
 No. 8 N. Hall, Univ. of Chicago, Chicago, Illinois  
 Charles S. Dimmick, B. S. (In Engineering) . . . . . Schenectady, New York  
 Frederic Eugene Dion, B. S. (In Engineering), . . . . . Glendive, Montana  
 Stella Louise Duncan, B. A. (Classical) . . . . . Kalispell, Montana  
 Florence Editha Ervey, B. A. (Classical) . . . . . Spokane, Washington  
 Thomas Joseph Farrell, Jr., B. A. (Literary) . . . . . Missoula, Montana  
 Linda Ellen Featherman, B. A. (Literary) . . . . . Drummond, Montana



- Mary Monica Fergus, B. A. (Literary) . . . . . Butte, Montana  
 Susie Garlington, B. A. (Classical) . . . . . Stevensville, Montana  
 King Garlington, B. S. . . . . Missoula, Montana  
 Ralph Earl Gilham, B. S. . . . . Butte, Montana  
 Lawrence E. Goodbourne, B. A. (Classical) . . . . . Roseburg, Oregon  
 Laura May Hamilton, B. A. (Literary) (Mrs. R. L. Harmon) . . . . .  
 . . . . . Walla Walla, Idaho  
 Ralph L. Harmon, B. A. (Literary) . . . . . Walla Walla, Idaho  
 Anna J. Hutter, B. A. (Literary) . . . . .  
 . . . . . Couperville, Whidberg Island, Washington  
 Daisy Kellogg, B. A. (Literary) . . . . . Missoula, Montana  
 Jennie A. McGregor, B. A. (Classical) . . . . . Bonner, Montana  
 James Hamilton Mills, S. B. (In Engineering) . . . . . Butte, Montana  
 Josiah John Moore, B. S. . . . . 5509 Greenwood Ave., Chicago, Illinois  
 Frances Nuckolls, B. A. (Literary) (Mrs. E. P. Kelley) . . . . .  
 . . . . . 975 Copper St., Butte, Montana  
 William Hovey Polleys, B. S. (In Engineering) . . . . . Billings, Montana  
 Joseph William Streit, B. S. . . . . Missoula, Montana  
 Montgomery De Smith, B. S. (In Engineering) . . . . .  
 . . . . . Schenectady, New York  
 Lillian Warren, B. A. (Classical) (Deceased February 22, 1908).  
 Alice Brown Welch, B. A. (Literary) . . . . . Chicago, Illinois

## 1908

- Ethel Olive Ambrose, B. A. (Literary) . . . . . Missoula, Montana  
 Agnes Dorothea Berry, B. A. (Literary) . . . . . Missoula, Montana  
 Oral Jay Berry, B. S. . . . . Missoula, Montana  
 Charles Amos Buck, B. S. (Engineering) . . . . . Stevensville, Montana  
 Nell Cavette Bullard, B. A. (Literary) . . . . . Missoula, Montana  
 Vincent Stuart Craig, B. S. (Engineering) . . . . . Missoula, Montana  
 Arthur George Davidson, B. S. (Engineering) . . . . . Tooele, Utah  
 Margery Winnifred Feighner, B. A. (Literary) . . . . . Missoula, Montana  
 Phoebe Aditha Finley, B. A. (Literary) . . . . . Missoula, Montana  
 Helen Goddard, B. A. (Classical) . . . . . Billings, Montana  
 Carrie Elizabeth Hardenburgh, B. A. (Literary) . . . . . Missoula, Montana  
 Fanny Hatheway, B. A. (Classical) (Mrs. John Lucy), Missoula, Montana  
 Frances Margaret Jones, B. A. (Literary) . . . . . Anaconda, Montana  
 Minta Lee McCall, B. A. (Classical) (Mrs. J. H. Bonner) . . . . .  
 . . . . . Missoula, Montana  
 Herman Cole McGregor, B. S. (Engineering) . . . . . Bonner, Montana  
 Arthur Ivason Morgan, B. A. (Literary) . . . . . Hope, Idaho  
 May Elizabeth Murphy, B. A. (Literary) . . . . . Helena, Montana  
 Ruth Lenore Smith, B. A. (Classical) . . . . . Stevensville, Montana  
 Helen Antoinette Smead, B. S. . . . . Missoula, Montana  
 James Beryl Speer, B. A. (Literary) . . . . . Missoula, Montana  
 Clarissa Spencer, B. S. . . . . Havre, Montana  
 Roy Newton Whitesitt, B. A. (Literary) . . . . . Stevensville, Montana  
 Edward Angus Wenger, B. S. (Engineering) . . . . . Butte, Montana

## 1909

- Almeda Andrews, B. A. (Classical) . . . . . Missoula, Montana  
 George Edward Beavers, B. S. . . . . Billings, Montana  
 Bess Margaret Bradford, B. A. (Literary) . . . . . Missoula, Montana  
 Dera Montana Buswell, B. A. (Literary) . . . . . Missoula, Montana  
 Ida May Cunningham, B. A. (Literary) . . . . . Missoula, Montana

Ceciel Katherine Dwyer, B. A. (Literary)	Missoula, Montana
Charles Frederick Farmer, B. S. (Engineering)	Missoula, Montana
Marie Sophie Freeser, B. S.	Helena, Montana
Frederick Greenwood, R. A. (Literary)	Spokane, Washington
Berney Fred Kitt, B. S. (Engineering)	Missoula, Montana
Frank Lewis, B. S. (Engineering)	Missoula, Montana
Jennie Marguerite Lyng, B. A. (Literary)	Highwood, Montana
Gilbert Drake McLaren, B. S.	Hamilton, Montana
Edna Crete Pratt, B. A. (Literary)	Tacoma, Washington
Mary Frances Rankin, B. A. (Literary)	Missoula, Montana
Florence Ethela Thieme, B. A. (Classical)	Missoula, Montana
Alice Anne Wright, B. A. (Literary)	Missoula, Montana
William Montgomery Van Eman, B. S. (Engineering)	Seattle, Washington

### HONORARY DEGREES CONFERRED

#### 1901

Thomas H. Carter, LL. D.	Helena, Montana
United States Senator	

#### 1902

Joseph K. Toole, LL. D.	Helena, Montana
Governor of Montana	

#### 1904

Hiram Knowles, LL. D.	Missoula, Montana
United States Judge	

#### 1909

Howard Taylor Ricketts, LL. D.	Chicago, Illinois
Professor, University of Chicago	

## 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 provision for the exemption of experienced accountants now 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 will be held December 15th and 16th, 1909, and thereafter 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 are equal to those prescribed for applicants for examination, who are known to the Board of Examiners as competent and skilled accountants; provided, they shall 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.

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