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1912-1913 Course Catalog

University of Montana--Missoula. Office of the Registrar

BULLETIN

OF THE

UNIVERSITY OF MONTANA

Issued Bi-Monthly at Missoula, Montana

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MAY 1913

REGISTER, ~~1913-14~~ 1912-13

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PUBLICATIONS OF THE UNIVERSITY

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

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

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

THE EIGHTEENTH
REGISTER

OF THE

University of Montana

MISSOULA, MONTANA

1912-13

With Certain Announcements
for 1913-14

SENTINEL PRESS
MISSOULA, MONTANA

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UNIVERSITY CALENDAR
1913-14

FIRST SEMESTER.

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Registration day, Tuesday, September 9.

Instruction begins, 8:30 a. m., Wednesday, September 10.

Thanksgiving recess, 12:30 p. m., Wednesday, November 26, to 8:30 a. m., Monday, December 1.

Christmas holidays, 4:00 p. m., Friday, December 19, to 8:30 a. m., Monday, January 5.

First semester ends, 4:00 p. m., Friday, January 30.

SECOND SEMESTER.

Entrance examination, Monday, February 2.

Registration day, Tuesday, February 3.

Instruction begins, 8:30 a. m., Wednesday, February 4.

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

Charter day, Friday, February 20.

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Interscholastic meet, Wednesday, Thursday, Friday, Saturday, May 13, 14, 15, 16.

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Baccalaureate day, Sunday, May 31.

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Class day exercises, 10:30 a. m., Wednesday, June 3.

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SUMMER SESSION.

Registration day, Monday, June 8.

Instruction begins, 8:00 a. m., Tuesday, June 9.

Instruction ends, 4:00 p. m., Friday, July 17.

MONTANA STATE BOARD OF EDUCATION

EX-OFFICIO.

GOVERNOR SAMUEL V. STEWART, President.
D. M. KELLY, Attorney General.
H. A. DAVEE, Supt, Pub. Instruction, Secretary.

APPOINTED.

S. D. LARGENT	Term Expires	February		8, 1916
W. S. HARTMAN	"	"	"	12, 1916
JOHN DIETRICH	"	"	"	10, 1917
J. C. SMITH	"	"	"	10, 1917
N. R. LEONARD	"	"	"	1, 1914
C. H. HALL	"	"	"	7, 1914
O. W. McCONNELL	"	"	"	1, 1915
W. H. NYE	"	"	"	1, 1915

BYRON E. TOAN . . . . . Clerk of the Board

EXECUTIVE BOARD OF UNIVERSITY

E. B. CRAIGHEAD . . . . . Chairman (ex-officio)
J. H. T. RYMAN, Treasurer . Term Expires April 19, 1913
J. M. KEITH . . . . . Term Expires April 19, 1915
J. D. DUNLOP . . . . . Secretary

THE FACULTY

EDWIN BOONE CRAIGHEAD, LL. D., D. C. L. . . . . 661 University Avenue

President.

A. M., Central College, 1883; teacher, Neosho Collegiate Institute, 1884; graduate student, Vanderbilt University, 1884-86; graduate student, University of Leipsic, 1887; graduate student, University of Paris, 1888; Professor of Latin, Emory and Henry College, 1889; Principal Pryor Institute, 1890; Professor of Greek, Wofford College, 1890-93; President, South Carolina Agricultural and Mechanical College and Director Experiment Station, 1893-97; President Central College, 1897-1901; LL. D., University of Missouri, 1898; President State Normal School, Warrensburg, 1901-1904; President Tulane University, 1904-1912; D. C. L., University of the South, 1907; President University of Montana since August 15, 1912.

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

Professor of Latin and Greek.

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

FREDERICK C. SCHEUCH, M. E., A. C. . . . . 309 South Fifth St. West

Professor of Modern Languages.

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

MORTON JOHN ELROD, Ph. D. . 205 S. Fifth St. East

Professor of Biology.

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

FRANCES CORBIN, B. L. . . 128 S. Fourth St. West

Professor of Literature.

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.

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

Professor of Geology.

B. S., University of Nebraska, 1897; M. A., 1903; Ph. D. 1906; Student University of Orgeon, 1893; Graduate Student, University of California, summer, 1901; Graduate Student, Chicago University, summer, 1905; Assistant in Geology, University of Nebraska, 1894-97, Fellow and Instructor, 1897-98; Assistant Principal, High School, Butte, 1898-99; Principal Lincoln School, Butte, 1899-1900; Instructor in Physics and Geology, University of Montana, 1900-01; Director, University of Montana Geological Survey, since 1902; Assistant, United States Geological Survey, 1906; Professor of Physics and Geology, University of Montana, 1901-10; Professor of Geology, since 1910.

JOSEPH HARDING UNDERWOOD, Ph. D., LL. D. . . . . 516 Woodford St.

Professor of History and Economics.

B. A., Western College, 1902; M. A., State University of Iowa, 1904; Ph. D., Columbia University, 1907; LL. D., Otterbein University, 1910; Graduate Scholar in Economics, State University of Iowa, 1902-03; Fellow in Economics, State University of Iowa, 1903-04; University Fellow in Sociology, Columbia University, 1904-05; Student, University of Chicago, 1906; Instructor in English and History, Nora Springs (Iowa) Seminary, 1905-06; Professor of History and Political Science, Leander Clark College, 1906-07; Professor of History and Economics, University of Montana, since 1907.

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

Professor of Mathematics.

Ph. B., University of Michigan, 1897; Graduate Student, University of Chicago, 1897-98, and Summers, 1899, 1900, 1902, 1905, 1906, 1907, 1911; 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.

ARTHUR WILLIAM RICHTER, M. M. E. 1414 Maurice Avenue

Dean of School of Engineering.

B. M. E., University of Wisconsin, 1889; M. E., University of Wisconsin, 1891; M. M. E., Cornell University, 1899; Instructor in Engineering, 1892-93; Assistant Professor of Steam Engineering, 1893-96; Assistant Professor of Experimental Engineering, 1896-1902; Professor of Experimental Engineering, University of Wisconsin, 1902-09; Consulting practice, also Consulting Engineer, Wisconsin State Board of Control, 1908-09; Professor of Engineering, University of Montana, 1909-1912; Dean of School of Engineering, since September, 1912.

JOSEPH EDWARD KIRKWOOD, Ph. D. 305 University Avenue

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, 1909-10; Professor of Botany and Forestry, since September, 1910.

GEORGE FULLMER REYNOLDS, Ph. D. 1122 Higgins Avenue

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; Fellow in English, University of Chicago, 1901-02; Head of English Department, Shattuck School, Faribault, Minn., 1902-09; Assistant Professor of English and Rhetoric, University of Montana, 1909-10; Professor of English and Rhetoric, since September 1, 1910.

GUSTAV L. FISCHER . . . 503 S. Fourth St. West

Professor of Music.

Musical Student in Hamburg, Weimar, Buckeburg, and Frankfurt; Member of Theodore Thomas Orchestra, St. Louis Choral Symphony Society and World's Fair Symphony Orchestra; Professor of Music, University of Montana, since September 1, 1910.

HENRY WINTHROP BALLANTINE, A. B., LL. B., ... 404 Connell Avenue

Dean of the Law School, W. W. Dixon Professor of Law.

A. B., Harvard College, 1900; LL. B., Harvard Law School, 1904; Lecturer in Law, University of California, 1905-09; Assistant Professor of Law, Hastings College of the Law, 1905-09; Practicing Attorney in San Francisco, 1904-11; Professor of Law, and Acting Dean of Law School, University of Montana, 1911-12; Dean of Law School, since September 1, 1911.

A. N. WHITLOCK, A. M. LL. B. . . 317 S. Sixth St. E.

Professor of Law.

A. B., University of Kentucky, 1906; A. M., ibid., 1908; Principal Caldwell High School, Richmond, Ky.; 1906; Assistant Professor in English and Assistant in Academy, University of Kentucky, 1906-08; LL. B., Harvard Law School, 1911; Member of Kentucky Bar since 1909; Assistant Professor of Law, University of Montana, 1911-12; Professor of Law, since September 1, 1912.

CHARLES MELVIN NEFF, LL. B. . 526 East Front St.

Professor of Law.

Ph. B., University of Rochester, N. Y., 1899; LL. B., Columbia Uniersity, 1902; Practicing Lawyer, New York City, 1902-05; Practicing Lawyer, Colorado, 1905-12; Professor of Law, University of Montana, since September 1, 1912.

JOHN BERTRAND CLAYBERG, LL. B. . San Francisco, Cal.

Non-Resident Lecturer on Mining and Irrigation Law and Consulting Dean.

LL. B., University of Michigan, 1875; Attorney General of Montana, 1899; Commissioner, Supreme Court of Montana, 1903-05; Non-Resident Lecturer on Mining and Irrigation Law, University of Michigan; Columbia University and Montana School of Mines; Honorary Dean of Law School, Professor of Mining and Irrigation Law and Montana Code Practice, University of Montana, 1911-12; Non-Resident Lecturer on Mining and Irrigation Law and Consulting Dean, since September, 1912.

WILLIAM WEBB KEMP, Ph. D. . . . . 432 Eddy

Professor of Education.

A. B., Leland Stanford Junior University, 1898; Ph. D., Columbia University, 1912; Graduate Student, Stanford University, 1904-05; University of California, 1905-06; Scholar, Teachers' College, Columbia, 1910-11; Fellow,

Teachers' College, Columbia, 1911-12; Foreign Research Scholar, Teachers' College, Columbia, Summer of 1911; Instructor in History, Hoitt's School, California; Principal of Schools, Alameda, California, 1903-05; Head Department of Education and Director of the Training School, State Normal School, San Diego, California, 1906-10; Bibliographer, Educational Department, New York Public Library, 1910; Professor of Education, University of Montana, since 1912.

THADDEUS L. BOLTON, Ph. D.

Professor of Psychology.

A. B., University of Michigan; Ph. D., Clark University, 1894; Psychological Specialist and Teacher in Worcester, Mass., Normal School, 1893-1896; Teacher of Psychology in San Jose Normal School, 1896-97; Professor of Philosophy and Education, University of Washington, 1897-98; Student at Berlin, Leipzig and Heidelberg, 1898-99; Instructor and Junior Professor of Psychology, University of Nebraska, 1899-1910; Director of Training School and Professor of Psychology and Education, Tempe Normal and Agricultural School of Arizona, 1910-13; Professor of Psychology, University of Kansas Summer School, 1911, 1912 and 1913; and Professor of Psychology, University of Montana, since September, 1912.

RICHARD HENRY JESSE, Jr., Ph. D. 539 University Ave

Professor of Chemistry.

A. B., University of Missouri, 1902; A. M., Harvard University, 1907; Ph. D., Harvard University, 1909; with Mallinckrodt Chemical Works, St. Louis, 1904; Austin Teaching Fellow in Chemistry, Harvard University, 1907-08; Thayer Scholar and Carnegie Research Assistant, Harvard University, 1908-09; Instructor in Applied Chemistry, University of Illinois, 1909-11; Associate in Chemistry, University of Illinois, 1911-12; Professor of Chemistry, University of Montana, since September 1, 1912.

ROBERT NEAL THOMPSON, B. S. . . 322 Blaine St

Assistant Professor of 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, 1908; Instructor in Physics, University of Montana, 1909-10; Assistant Professor of Physics, since September 1, 1910.

WILLIAM R. PLEW, M. S. . . . 809 Hilda Avenue

Assistant Professor of Civil Engineering.

B. S., Rose Polytechnic Institute, 1907; M. S., 1910; Instructor in Civil Engineering, Rose Polytechnic, 1907-10; Assistant to City Engineer, City of Terre Haute, Ind., 1907-09; Engineer Paris Bridge Co., Paris, Ill., 1909; Instructor in Civil Engineering, University of Montana, 1910-11; Assistant Professor of Civil Engineering, since September 1, 1911.

PHILIP S. BIEGLER, B. S., E. E. . . 930 Poplar St.

Assistant Professor of Electrical Engineering.

B. S. E. E., University of Wisconsin, 1905; with Chicago Edison Company, 1899-1906; Instructor in Electrical Engineering, University of Iowa, 1906-08; Assistant Professor, 1908-09; Assistant to Electrical Engineer, Washington Water Power Electrical Company, 1909-10; Assistant Professor Electrical Engineering, Purdue University, 1910-11; Assistant Professor of Electrical Engineering, University of Montana, since September 1, 1911.

GEORGE H. CUNNINGHAM, B. S., M. E. . 410 Eddy St.

Assistant Professor of Mechanical Engineering.

B. S., Virginia Polytechnic Institute, 1906; M. E., Cornell University, 1908; Instructor in Graphics, Virgina Polytechnic Institute, 1906-07; Engineering Department of Tennessee Coal, Iron and Railroad Co., 1908-09; Engineering Department Virginia Bridge and Iron Co., 1909-10; Assistant Superintendent Power and Mechanical Department Consolidation Coal Co., 1911; Instructor in Mechanical Engineering, University of Montana, 1911-12; Assistant Professor of Mechanical Engineering, since September, 1912.

ELOISE KNOWLES, Ph. M. . . South Second St. West

Instructor in Fine Arts.

Boston Art School, 1892-93; Ph. B., University of Montana, 1898; Chase Art School, Shinnecock Hills, 1909; School of Education, University of Chicago, 1904; Art Institute, Chicago, 1904; Columbia University, 1909; Ph. M., University of Chicago, 1910; abroad, summers of 1903, 1906 and 1910; Instructor in Drawing, University of Montana, 1898-1910; Instructor in Fine Arts, since September 1, 1910.

MARY STEWART, A. B. . Craig Hall, University Grounds
Dean of Women and Instructor in Languages.

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

GERTRUDE BUCKHOUS, B. S. . 206 S. Fourth 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.

EUGENE F. A. CAREY, B. S. . 120 Burlington Avenue
Instructor in Mathematics.

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

PAUL CHRISLER PHILLIPS, Ph. D. . 122 Burlington Avenue
Instructor in History.

A. B., Indiana University, 1906; A. M., 1909; Ph. D., University of Illinois, 1911; Assistant in History, Indiana University, 1907-08; Fellow in History, University of Illinois, and student in government archives, Washington, London, and Paris, 1908-10; Assistant in American History, University of Illinois, 1910-11; Instructor in History, University of Montana, since September 1, 1911.

GEORGE MERIT PALMER, A.M. . . 523 Woodford St.
Instructor in English.

Graduate Illinois State Normal University, 1899; A. B., University of Illinois, 1907; A. M., University of Illinois, 1908; Graduate work, University of Illinois in History, English and Education, 1908-11; Superintendent of Schools, Averyville, Illinois, 1897-98, 1899-1901; Teacher of English, Philippine Islands, 1901-04; Superintendent of Schools, Milaca, Minnesota, 1904-07; Instructor in English, Academy, University of Illinois, 1907-09; Instructor in English in Academy and Supervisor of Practice Teach-

ing in English in School of Education, University of Illinois, 1909-11; Instructor in English, University of Montana, since September 1, 1911.

GUSTAV ADOLPH GROSS . . . . 517 Ford St.
Instructor in Engineering Shops.

Lake Mills (Wis.) High School, 1900; Assistant Foreman, Fargo Creamery Supply Co., 1904-08; Mechanician, College of Engineering, University of Wisconsin, 1908-11; Instructor in Engineering Shops, University of Montana, since September 1, 1911.

JAMES DENTON DUNLOP . . 304 S. Sixth St. East
Registrar.

WILLIAM GEORGE BATEMAN, A. M. . 329 Connell Avenue
Instructor in Chemistry.

A. B., Stanford University, 1907; A. M., Stanford University, 1909; Assistant in Chemistry, Stanford University, 1905-08; Instructor in Chemistry, Stanford University, 1908-10; Professor of Chemistry, Imperial Pei Yang University, Tientsin, China, 1910-12; Acting Professor of Chemistry, University of Montana, Summer Session, 1912; Instructor in Chemistry, University of Montana, since September 1, 1912.

W. WALTER H. MUSTAINE, B. S. . . 22 Rozale Apts.
Director of Physical Education.

B. S., The Centre College of Kentucky, 1899; Postgraduate work, Major Physiology, the State University of Kentucky, 1910, 1911, 1912; Graduate Yale Summer School of Physical Education, 1905; Graduate Chautauqua, N. Y., School of Physical Education, 1905; Graduate Harvard Summer School of Physical Education, 1911; Instructor in Gymnastics and Athletics, Hogsett Military Academy, 1897-1901; Director Boyle-Humphrey Gymnasium, Centre College, 1901; Director Physical Education, State University of Kentucky, 1902-1912; Director Lexington, Ky., Business Women's Physical Training Club, 1906-12; Supervisor Public Playgrounds, Lexington, Ky., 1907; President Kentucky Physical Education Society and Member National Council A. P. E. A., 1910; Director Physical Education, University of Montana, since November, 1912.

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

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

CARRIE CADE PATTON, A. B., B. L. S. 300 University Avenue
Reference Librarian.

A. B., Northwestern, 1909; B. L. S., Illinois State Library School, 1911; Assistant in the Library, University of Montana, since September 1, 1911.

INSTRUCTORS IN OBSERVATION AND PRACTICE TEACHING.

HANNA BOOK, A. B. (Indiana) . . . Mathematics
ELVA JAMESON, B. S. (Beloit) . . . . Botany
EDNA LEYENBERGER, A. B. (Grinnell) Modern Languages
A. C. MILLSPAUGH, A. B. (Albion College) . . History
MABEL G. RICH, A. B. (Wisconsin) . . . English

SPECIAL LECTURERS IN FORESTRY.

C. H. ADAMS, E. M. . . . . .
Assistant District Forester in Charge of Grazing, District No. 1.
R. B. ADAMS . . . . . .
. Superintendent of Telephone Construction, District No. 1
F. E. BONNER . . Chief of Geography, District No. 1
DONALD BRUCE, M. F. . Forest Assistant, District No. 1
H. H. FARQUHAR . . . . . .
. Forest Assistant in Charge of Planting, District No. 1
CHARLES W. JUNGBERG . State Forester of Montana
M. E. KNOWLES, D. V. S. . State Veterinarian of Montana
D. T. MASON, M. F., M. S. . . . . .
. . . . Assistant District Forester, District No. 1
J. F. PRESTON, A. B. Assistant District Forester, District No. 1

STUDENT ASSISTANTS.

PAUL A. BISCHOFF . . . . Assistant in Biology
HELENE BOLDT . . . . Assistant in the Library
LUCIUS FORBES . . . . Assistant in Physics
RALEIGH GILCHRIST . . . Assistant in Chemistry
ALICE HARDENBURGH . Assistant in Physical Culture
GLADYS HUFFMAN . . Assistant in Physical Culture
CECIL KRAMER . . . . Assistant in Mathematics
MILLARD F. NESBIT . . . Assistant in Chemistry
MARY SHULL . . Assistant in Botany and Forestry
ROY A. WILSON . . . . Assistant in Geology

ASSISTANTS IN OFFICE.

BERNICE OLDRIDGE . . Bookkeeper and Stenographer
ANNA DAVIS . . . . . Stenographer
EDITH ROLFE . . . . . Registration Clerk

EMPLOYEES.

RICHARD KESSLER . . . . . Engineer
THEODOR KESSLER . . . . Assistant Engineer
MAX KRANICH . . . . . Gardener

STANDING COMMITTEES OF THE FACULTY, 1912-1913.

The President is Ex-officio a member of all committees.

Admission and Registration:
ABER, Corbin, Dunlop, Kemp, Rowe, Richter.

Athletics:
MUSTAINE, Cunningham, Jesse, Plew, Rowe, Whitlock,

Attendance:
PLANT, Dunlop, Stewart.

Extension Lectures and Correspondence Study Department:
PLANT, Kirkwood, Knowles, Palmer, Phillips, Richter.

Graduate Work:
KEMP, Elrod, Reynolds, Underwood.

Interscholastic Meet:
ROWE, Elrod, Reynolds, Stewart, Thompson, Whitlock.

Public Accountancy:
UNDERWOOD, Ballantine, Dunlop.

Public Exercises:
REYNOLDS, Aber, Corbin, Fischer, Underwood.

Publications:
ABER, Ballantine, Bolton, Carey, Corbin, Dunlop, Reynolds, Richter.

Recommendations:
KEMP, Corbin, Dunlop, Plant, Richter.

Schedule and Examinations:
RICHTER, Carey, Elrod, Kemp, Mustaine.

Scholarship:
PLANT, Ballantine, Dunlop, Richter, Reynolds, Stewart.

State Fair Exhibit:
ABER, Elrod, Kirkwood, Knowles, Richter.

Student Affairs:
ROWE, Cunningham, Jesse, Reynolds, Stewart.

University Lecture Course:
ELROD, Buckhous, Phillips, Rowe, Thompson.

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 an endowment 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. The act also gave general directions concerning the organization of the different departments of the University, the courses of instruction, duties of the president, fees, etc.

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

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

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

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

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

Two buildings were then constructed, one known as University Hall, containing the library, museum, assembly room, class rooms, and president's office; the other, known as Science Hall, containing the necessary rooms for science and work in engineering as well as the steam plant for heating the buildings and furnishing power for the engineering laboratory. These buildings

were completed and formally presented to the State Board of Education, February 18, 1899.

The Legislative Assembly of 1901 authorized the issuing of $70,000 additional in 5 per cent bonds, due in thirty years and payable in twenty. It was also provided that $40,000 of these bonds should be issued at once and the remainder at the discretion of the State Board of Education. With the proceeds of this bond issue a Woman's Hall (now named Craig Hall in honor of the late President O. J. Craig) 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 later by the Supreme Court of Montana and also by the Supreme Court of the United States, that the income from the lands could not be applied to payment of interest and principal of building bonds, but must be devoted to the maintenance of the University. In accordance with this decision the General Assembly of 1907 passed an act looking to the assumption of this bonded debt by the state, and for the purpose of placing intact the permanent endowment funds of educational institutions. By favorable action of the voters at the general election in 1908, the legislative act was ratified, with the result that the endowment of the University is to be preserved unimpaired.

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

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

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

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 five hundred and twenty acres of land which are at present unimproved.

BUILDINGS.

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

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

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

Craig 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 basment, 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 bathrooms. 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 feet by 43 feet. In the rear of this are dressing and bath rooms for men and for women. These are supplied with hot and cold water, and the building is lighted by electricity and heated with steam radiators.

In the rear of the building, facing the track and athletic grounds, is a commodious grandstand and extensive bleachers.

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

An Infirmary Cottage specially designed for the isolation and care of students who may be suffering from contagious or infectious diseases, was constructed and furnished in 1910.

UNIVERSITY SURROUNDINGS.

Missoula is located in Western Montana, on the Chicago, Milwaukee and St. Paul 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

The completion of a four-year's 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 five 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 the following: 4 units of English; 2 to 4 units of language other than English; 3 to 4 units of Mathematics; 2 units of History; 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.

Graduates of high schools not in Montana are admitted on certificates without examination, provided such high schools are accredited to their state universities.

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

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

ADMISSION ON EXAMINATION.

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar of the University. For the academic year 1913-14 these days are September 8 and February 2.

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

MATHEMATICS—

(1). ALGEBRA—The elementary course should include fundamental operations upon literal members and expressions; factoring; highest common factor and lowest common multiple and fractions; ratio and proportion; graphical representation and solution of equations; theory of exponents; radicals; quadratic equations; radical equations. (One unit).

(2). ALGEBRA—The advanced course should include most of the subjects of the first course, but considered from a more mature point of view; equivalent equations; relation between roots of an equation and the coefficients; binominal theorem; complex numbers; logarithms; progressions. (One-half unit).

(3). GEOMETRY, PLANE AND SOLID—The equivalent of the subject matter in any of the standard texts, including a large number of "original exercises." (One and one-half units.)

(4.) PLANE TRIGONOMETRY—This course should cover 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. (One-half unit).

ENGLISH—

(1). COMPOSITION—The applicant must have the equiva-

lent of the English composition required in a four-years' high school course. Serious deficiency in spelling, punctuation, form, sentence-structure, grammatical inflections, or clearness of thought will be sufficient ground for rejection of the applicant's work.

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

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.

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.

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

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

PHYSICS—One year of Elementary Physics, the equivalent of Carhart and Chute's Elementary Physics, Millikan and Gale's First Course in Physics, Mann and Twist's Physics, or Henderson and Woodhull's Elements of Physics, 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. (One unit.)

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. (One unit.)

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. (One unit.)

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 advanced credit for courses taken in institutions of approved standards.

ACCREDITED HIGH SCHOOLS

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

"Any high school or academy whose course of instruction covers the branches requisite for admission to one or more of the courses of any State educational institution may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a committee appointed by the State Board of Education. Application for such examination may be made by any school board to the Secretary of the State Board of Education, whereupon a committee appointed by the State Board of Educa-

tion 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 June, 1910, the president of the University was authorized to designate members of the University Faculty as Assistant Inspectors.

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.

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. A course was prepared, reported to the Board, and formally adopted December 4, 1906.

This legislation was supplanted in June, 1910, when the State Board adopted new regulations upon courses of study in accredited High Schools, reported by a committee composed of Superintendent Largent, Superintendent Harmon and the President of the University. These regulations are as follows:

"Accredited High Schools of the State of Montana shall maintain one or more four-years' courses of study, in all of which the following subjects shall be constant elements for the minimum amounts indicated:

(1) English Composition and Literature, 4 years, 4 units;

(2) Languages other than English, 2 years, 2 units;

(3) Mathematics, 2 years, 2 units;

(4) Science, 1 year, 1 unit:

(5) History, 1 year, 1 unit;

Total in prescribed subjects, 10 units.

"The authorities of each accredited school in their discretion may make suitable combinations of the constant elements with selections from the following list of subjects in amounts sufficient to constitute one or more full four years' courses of not less than fifteen units:

(1) Languages, other than English, 4 years, 4 units.

(2) Mathematics, 2 years, 2 units.

(3) Science, 3 years, 3 units.

(4) History (including Civics and Economics), 3 years, 3 units.

(5) Drawing, 2 years, 2 units.

(6) Commercial Subjects, 4 years, 6 units.

(7) Industrial Subjects, 4 years, 6 units."

LIST OF ACCREDITED HIGH SCHOOLS.

(1912-13.)

City	Principal
Anaconda	A. R. Gilpin
Belt	S. A. Remington
Billings	W. H. McCall
Butte	Spencer D. Kelley
Chinook	G. H. William
Columbus	W. G. Alway
Forsyth	H. Mackenzie
Fort Benton	C. M. Luce
Glasgow	D. S. Williams
Great Falls	A. D. Wiggin
Hamilton	Henry Schwarm
Havre	Grace M. Easter
Helena	A. J. Roberts
Laurel	D. S. Clinger
Plains	W. H. Shipley
Pony	O. W. Wilkins
Stevensville	A. A. McSweeney
Virginia City	C. B. Drake
Victor	J. H. Holst

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

Private Schools.

Central High School—Butte	Rev. M. McCormack
Mount Angela Ursuline Academy—Great Falls	Mother Xavier
Sacred Heart Academy—Missoula	Sister Martha of Bethany
Saint Vincent's Academy—Helena	Sister Mary Berchmans

REQUIREMENTS FOR GRADUATION

The present organization of courses of study within the University was adopted in 1909 by action of the Faculty. Instead of the fundamental principle of the "group system," with elective elements, the principles of "elective" and "major department" systems have been fused and adopted. These are 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 of 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.....6 hours
4 Courses in Physical Culture (2 exercises per week for 2 weeks) .....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 REGISTRATION REGULATIONS

To encourage a higher grade of scholarship the Faculty has adopted the following statements of policy and regulations on registration:

1. Any student who has (and no student who has not) done exceptionally good work in any semester may be allowed to register for more than 16½, but not more than 18½ hours' credit in the succeeding semester.

This section does not apply to students in the Professional Schools.

2. Students of marked ability, if health and other circumstances are favorable, and if they have done exceptionally good work in previous semesters, should be encouraged to register for more than the normal average of 15 or 15½ credit hours.

3. "Exceptionally good work" shall be interpreted to mean

that at least one-half of the work registered for shall receive grades of A or A+ and that no grade shall be lower than B+.

4. Students who may have been permitted to register for more than 16½ credit hours and who are failing during a semester to do at least passing work in any course shall have their registration reduced to 16½ credit hours or less.

5. Students dropping a course more than four weeks after registration shall receive a D unless excused from this mark by the Committee on Registration on the recommendation of the instructor. Students so dropping a course after the end of four weeks shall not be allowed to register in the same number of hours in work of similar grade.

6. All students taking eight or more hours shall be automatically registered in the generally required courses (1) unless they have already secured credit either here or elsewhere for such courses. (2) Unless they are excused on petition to the Committee on Admission and Registration, which petitions have been approved by the department of English or Physical Culture. The Committee on Admission and Registration may require students failing in required subjects to drop other courses if this in the judgment of the Department of English or Physical Culture will aid them in passing the required subjects.

7. The first scholarship report shall be made at the end of four weeks from the beginning of the semester.

SPECIAL AND IRREGULAR STUDENTS.

1. Persons admitted to registration with less than 13 units of entrance requirements shall be called Special Students in whatever department or school their work is taken.

2. Persons under 20 years of age shall not be admitted as special students.

3. Persons 21 years of age who present 13 or more units of high school work, or their equivalent for entrance requirements may be admitted to the law school and shall be called Specials in Law.

4. Persons admitted to registration with 13 or more units of entrance requirements and allowed to take courses without following requirements as to number of hours, and required and elective courses, shall be called Irregular Students.

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.

DEGREES OF B. A. AND B. S.

Requirements for the degrees of Bachelor of Arts and Bache-

lor 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.

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING.

The requirements for the degree of B. S. in Engineering include at least one hundred and twenty credits, in addition to those prescribed in Physical Culture. The three courses of study for Civil Engineering, Mechanical Engineering, and Electrical Engineering, respectively, are given in full under the School of 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 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 on graduate work.

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 School 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 encourage and promote the study of educational science.
2. To teach the history of education and of educational systems and doctrines.
3. To provide such courses of instruction as will secure to teaching the rights, prerogatives and advantages of a profession.
4. To fit certain University students for the higher positions in the public school service, and specifically in high schools.

The Twelfth Legislative Assembly enacted a law recognizing the diploma of the University, when accompanied by its Certificate of Qualification to Teach, as a legal license to teach in high schools.

Students wishing to receive the Certificate of Qualification to Teach should note the following regulations, passed by the faculty and approved by the State Board of Education:

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, and must have maintained a good standard of scholarship throughout his college course.

3. GENERAL PROFESSIONAL KNOWLEDGE—He must have taken not less than fifteen hours in education distributed among the following subjects:

A. History of General and Secondary Education.

B. Principles of Education, including the study of educational aims, values and processes, and principles of general method.

C. Educational Phychology, with special emphasis on adolescence.

D. School Hygiene.

E. The High School, its evolution, organization, management and problems.

4. SPECIAL PROFESSIONAL KNOWLEDGE—

A. The candidate must have made a detailed and special study of the subject or subjects which he expects to teach, and have done at least 20 semester 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 which he expects to teach (one or two hours).

C. Have completed five semester hours in observation and practice teaching under the direction of the head of the Department of Education and guidance of a critic teacher of the subjects to be taught.

All general questions relating to each student's professional work will be under the supervision of a special committee, of which the head of the Department of Education is the chairman. All recommendations for the teacher's certificate are made to the Faculty through this committee.

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

By agreement with the Missoula County High School Board opportunities for observation and practice teaching with the assistance of the Faculty of the high school will be given in the second semester of the senior year to students who are recommended as candidates for the Certificate of Qualification to Teach.

FEES AND DEPOSITS

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

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

An incidental fee of five dollars must be paid annually on the day of registration.

Exemption from the payment of the matriculation fees (but not the incidental fees) is granted to one student from each

graduating class of each accredited school in the state, provided the faculty of the high school will recommend the student as having been distinguished for scholarship. This exemption constitutes an Honor Scholarship extending through four undergraduate years.

From students previously matriculated who present themselves for registration after the official registration days, a special registration fee is required.

Tuition fees in the Law School are $40 per year, or $20 per semester. To those carrying less than ten semester credit hours of Law courses, the tuition charge will be $2.00 per semester credit hour.

Tuition fees in the Department of Music for individual instruction are $20 per semester for one lesson per week.

All tuition fees must be paid on the first day of the student's registration in each semester.

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.

EXPENSES

Women students who do not make their homes with their families in or near Missoula, are expected to live in Craig Hall, unless permission to live elsewhere is obtained from the faculty. This building is well furnished, lighted, and heated, for its special purpose, and will be comfortably house about sixty students. The University itself has the entire management of the Hall, making a combined charge of $25.00 per month for room and board. An extra charge of $2.00 per month must be paid by a single occupant of a room. Rooms are fully furnished except that each student is expected to supply her necessary linen, sheets, pillow cases, towels, curtains, and table napkins.

Men students are expected to find rooms and board in private families. By combining in club houses, either as fraternities or otherwise, young men may live at very reasonable rates. They may obtain meals at Craig 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 AND AID 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 themselves 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, in Craig Hall, as carpenters, janitors, gardeners, 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 Registrar.

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

SCHOLARSHIP AND CONDUCT

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

Special students whose work is not satisfactory will not be permitted to register in the succeeding semester without permission from the Committee on Admission and Registration.

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

Students who are not doing satisfactory work will not be permitted to engage in student activities other than intercollegiate.

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.

ATTENDANCE RULES.

1. All absences from classes or laboratories shall be settled with the instructor in charge, and all work shall be made up at his direction.

2. Reports on scholarship as to satisfactory or unsatisfactory work shall be made every six weeks to the office and there recorded and immediately referred to the deans in the schools of Law and Enginering and to the committee on scholarship in the College of Arts and Sciences.

3. All weekly attendance reports shall be made in the same manner and referred to the deans and the proper committee.

4. All cases of persistent or flagrant absence or deficiency in scholarship shall be reported to the deans or to the committee on attendance or scholarship who, together with the instructor shall deal with the offending student.

SCHOLARSHIPS AND PRIZES

HONOR SCHOLARSHIPS.

One student in each graduating class of each of the accredited high schools of the state is entitled to an Honor Scholarship in the University, provided he or she is recommended by the faculty of the high school as distinguished for scholarship. These scholarships exempt the holders from the payment of Matriculation 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 is now held by Miss Bernice Selfridge of Helena, Montana. It will be awarded again in 1915.

KEITH SCHOLARSHIP.

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

Applications for the scholarship, directed to the President of

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

BUCKLEY PRIZE IN ORATORY.

This prize was founded by Dr. J. J. Buckley, of Missoula, in memory of his father, Mr. H. N. Buckley, and is awarded annually to the successful competitor in an oratorical contest, under conditions prescribed by the faculty. The amount of the prize is twenty dollars. It was won in 1913 by Mr. Payne Templeton of Missoula.

ANNIE LEWIS JOYCE MEMORIAL MEDAL.

This prize was founded by Attorney M. M. Joyce of Missoula, in memory of his wife, and is awarded annually for the best essay, thesis or poem by an undergraduate. In 1913 it was won by Mr. George Armitage of Billings.

BENNETT PRIZE ESSAY.

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

The subject for 1912-13 is "Woman Suffrage and Democracy."

THE 1904 CLASS PRIZE.

The endowment fund for this prize was donated by the members of the class of 1904, who, in rotation, name the particular excellence for which the prize shall be given. For the year 1904-05 it was awarded to the student holding the highest rank in the first year college class in Latin, and was won by Miss Cora Averill; for the year 1905-06 to the student representing the University 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; for 1909-10, to the student making greatest progress in Greek, won by Miss Viola Golder; for 1910-11, to the student doing the best work in Geology, won by Mr. E. A. Winstanley; for 1911-12, to the best student in elementary Chemistry, won by Mr. Rayleigh Gilchrist.

MUSIC MEDALS.

A medal is given annually in the Department of Music by Mrs. E. L. Bonner for advanced piano technique. It was awarded in 1911 to Miss Gladys Huffman of Butte.

THE C. A. DUNIWAY SCHOLARSHIP BOOKS.

A fund of $400, established by former President Duniway provides standard books within the various fields of knowledge to be awarded annually to students distinguishing themselves by scholarship in the several departments. In 1912 these books were given as follows:

Biology, Mr. Donovan Worden; Botany, Mr. Frank Trask; Chemistry, Mr. D. B. Conrad; Engineering, Mr. E. W. Fredell; English, Miss Florence De Ryke; Fine Arts, Miss Frances C. Leary; Geology, Mr. Roy A. Wilson; History and Economics, Miss Mary Catherine White; Law, Mr. A. B. Hoblitt; Latin and Greek, Miss Edna Louise Sinclair; Literature, Miss Florence De Ryke; Mathematics, Miss Birdie F. Hunter; Modern Languages, Miss Gertrude A. Whipple; Philosophy and Education, Miss Mary Catherine White; Physics, Mr. Rayleigh Gilchrist.

MISCELLANEOUS

UNIVERSITY PUBLICATIONS.

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

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 appropriate committees, manages such general interests as athletics, oratory, debates, entertainments, etc.

Two literary societies, the Hawthorne and Clarkia, are open to students. The first-named society is composed of young men and the second of young women. Students will find membership in either of these societies helpful and pleasant.

Branches of the Y. M. C. A. and the Y. W. C. A. are organized in affiliation with intercollegiate associations, and carry on 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 provide music for University events during the year, and furnish an opportunity for

all students who have musical talent to cultivate it as well as to participate in the social pleasures pertaining to such organizations.

The Penetralia Society is an honor organization of women students, a non-secret society, devoted to advancing the interests of the University in every feasible way.

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

THE STATE ORATORICAL ASSOCIATION.

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

DEBATING CONTESTS.

By joint agreement with the State College of Washington, debates between representative teams of two men each from each institution are held annually. A similar arrangement exists between the University and the Montana College of Agriculture and Mechanic Arts.

In 1913 the University of Montana was represented in the debate with Washington State College by Mr. Horace S. Davis and Mr. Gordon Watkins, and in the debate with the Montana State College of Agriculture and Mechanic Arts by Mr. Will Long and Mr. Payne Templeton. Both debates were won by the University.

PUBLICATIONS BY STUDENTS.

A University Press Club with a joint stock membership publishes The Weekly Kaimin as a newspaper. The paper, through the effective efforts of its corps of editors, has become a permanent factor in the University life. In 1912-13 the Kaimin passes into control of the A. S. U. M.

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

ATHLETICS.

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

The Gymnasium has an equipment of apparatus and baths. The athletic field, located in the northeast 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

GENERAL CONTROL—A Faculty Committee on Athletics, with the Director of Physical Education as chairman, shall have oversight and control of athletic sports, including eligibility of athletes and schedule of intercollegiate match contests. The financial management shall be in control of the Associated Students of the University of Montana.

ATHLETICS AND SCHOLARSHIP—To be eligible to participate in intercollegiate contests, a student must have had a passing grade in at least ten credit hours at the time of the regular scholarship report next preceding, and in the case of those previously enrolled in this University or other collegiate institution, must have received credit for at least ten hours in which he was registered during the preceding semester, and at the end of said semester.

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

Second: Games with institutions not in the Montana Intercollegiate Athletic Association may be scheduled if the institution concerned enforces rules substantially the same as those of this Association.

Third: The University will not countenance athletic games of any sort on Sunday, nor on Memorial Day.

Fourth: No contracts relating to athletics under the jurisdiction of the A. S. U. M. will be considered binding unless countersigned by the proper A. S. U. M. officer and the Director of Physical Education.

Fifth: The football season must close on or before the Saturday following Thanksgiving Day of each year.

Sixth: No engagement shall be made requiring more than four days' consecutive absence, not counting holidays.

ANNUAL INTERSCHOLASTIC MEET.

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

In determining and administering rules of eligibility for contestants the University has had the invaluable aid of the Montana State Interscholastic Athletic Association, now known as the Montana High School Athletic Association. This is a

league of accredited high schools of the state, organized for the promotion and control of athletics.

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

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 1913 is held May 7, 8, 9, 10, and that for 1914, will be held May 13, 14, 15, 16.

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. In 1912 it was held on May 7th. The several series of contests have been held for six years, beginning in 1907.

THE LIBRARY

The General Library, consisting of about 21,000 volumes and 10,000 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, 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 over 200 periodicals, the current numbers of which are available in the reading room, as are newspapers and college exchanges. Through the courtesy of the editors a large number of the daily and county newspapers of Montana are sent to the reading room for the use of students.

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

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

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

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

THE MUSEUM

Owing to the lack of sufficient room for classes the museum has been temporarily distributed in various places. The space in the Library formerly used for the museum has been converted into a library and recitation room for the Law Department. The working collections are given space with the departments that make use of them. In the department of Geology and Mineralogy are several cases filled with ore specimens and fossils. The herbarium is in the Botany department, and occupies a large space. The collection of insects, bird skins, a part of the shells, and most of the alcoholic materials is taken care of in the Department of Biology.

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 United States 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 United States 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 doner's name recorded.

EDUCATIONAL LIBRARY OF REFERENCE, SCHOOL TEXTS AND EXHIBITS.

There is being built up in connection with the Department of Education in University Hall, an Educational Library of Reference, School Texts and Exhibits, designed to present illustrative materials of the entire educational field to the students of education in the University and to the teachers of the state. When finally completed it will contain in its several sections, (1) the best school texts in all elementary and secondary school subjects; (2) charts, maps, school supplies and such other illustrative material as may show the application of the newest and most advanced ideas in education and methods; (3) a carefully selected list of the best books on the psychology of learning, on the methods and art of teaching, on the growth and development of children, on educational psychology and the psychology of special methods in the several school branches, on mental and school hygiene, etc.; (4) old text books and materials illustrating the history and development of methods; (5) a collection of all national, state and city reports, the published proceedings of educational associations, and societies, copies of school laws of the various countries and states, reports of Boards of Education, educational bulletins, and all general and special books of reference; (6) typical sets of text books used in German, Scandinavian and French elementary and secondary schools; (7) the catalogues of the leading universities, colleges, normal and technical schools of the world; (8) a complete set of the text books used in Montana schools, and such other materials as may show the progress made by the schools of the state; (9) classified bibliographies for all divisions and aspects of the educational field; (10) the reports and files of special studies of educational problems in the fields of child study, educational psychology, statistics and hygiene; (11) educational journals devoted to the printing of general educational news and results of current investigations of educational problems.

DEPARTMENTS AND COURSES OF INSTRUCTION

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

Carefully revised schedules of days and hours for all courses are compiled and given to all students in the arrangement of the student's program.

LATIN AND GREEK

MAJOR REQUIREMENTS.

Students choosing this department for their major work will be required to take as 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 of Latin, the rest of the required hours may be given to Latin or Greek.

Candidates for the Teacher's Certificate must have completed courses IA, IB, IIA, IIB, III, IV, and IX in Latin.

COURSES IN LATIN.

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

IA. CICERO—De Amicitia and De Senectute of Cicero.
First semester; 3 credit hours; M. W. F., 9:30.

IB. PROSE COMPOSITION—
First semester; 2 credit hours; T. Th., 9:30.

IIA. LIVY—Books XXI and XXII.
Second semester; 3 credit hours; M. W. F., 9:30.

IIB. PROSE COMPOSITION—
Second semester; 2 credit hours; T. Th., 9:30.

III. CATULLUS, HORACE—Selected Poems of Catullus and Odes and Epodes of Horace.
First semester; 3 credit hours; M. W. F., 8:30.

IV. TACITUS—The Agricola and Germania.
Second semester; 3 credit hours; M. W. F., 8:30.

V. HORACE, JUVENAL—Selected Epistles of Horace and Satires of Horace and Juvenal.
Second semester; 3 credit hours; time to be arranged.

VII. LUCRETIUS—Selections from De Natura Rerum.
First semester; 3 credit hours; time to be arranged.

VIII. PLINY, CICERO—Selected Letters of Pliny and Cicero.
Second semester; 3 credit hours; time to be arranged.

IX. ROMAN LIFE—A view of Roman life such as is presented in "Life of the Greeks and Romans" by Guhl and Kohner, and Johnson's "Private Life of the Romans" and similar studies. The work is conducted by reading works of reference, guided by syllabi of lessons, with the aid of informal talks and illustrations by photographs and stereopticon views.
Second semester; 3 credit hours; M. W. F., 1:30.

COURSES IN GREEK.

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

I. BEGINNING GREEK—White's First Greek Book.
First Semester; 5 credit hours.

II. BEGINNING GREEK—Completion of First Greek Book and beginning Xenophon's Anabasis.
Second semester; 5 credit hours.

III. XENOPHON. PROSE COMPOSITION—Four books of Anabasis completed, with composition based on the text read.
First semester; 5 credit hours.

IV. HOMER—Selections from the Iliad and Odyssey.
Second semester; 5 credit hours.

V. HERODOTUS, THUCYDIDES—Selections from Herodotus and Thucydides.
First semester; 3 credit hours.

VI. PLATO—Apology and Crito of Plato.
Second semester; 3 credit hours.

VII. DRAMA—A play each of Aeschylus and of Sophocles, and selections from Euripides and Aristophanes.
First semester; 3 credit hours.

VIII. PINDAR, DEMOSTHENES—Selected Odes of Pindar, Demosthenes on the Crown.
Second semester; 3 credit hours.

IX. GREEK LIFE—A course like that in Roman life described above, with Blumner's "Home Life of the Ancient

Greeks," and Guhl and Kohner's "Life of the Greeks and Romans," as the principal work of reference.

First semester; 3 credit hours.

ENGLISH AND LITERATURE

Students who make these their major departments are advised to arrange their work as follows:

FIRST YEAR—Courses I, II, XI, XII, LI, LII, German I and II, Science, 4 hours.

SECOND YEAR—Courses III, IV, XIII, XIVa and b, XXIV, German III and IV, English History; Elective, 10 hours, which if the Teacher's Certificate is desired, should be Psychology I, II.

THIRD YEAR—Courses XV or XXXI, XVI, XVIII, XXIII, XXV, XXVI or XXXII, French I and II; Elective, 10 hours, which if the Teacher's Certificate is desired, should be in Education.

FOURTH YEAR—Courses XVII, XIX, XX, XXI, XXII, XXVII, XXXI or XV, XXXII or XXVI; Elective, 12 hours. If the Certificate to Teach is desired, the electives should consist of XXVIII and Education.

The courses in these departments are open to other students as indicated in the parentheses following each description.

COURSES OF INSTRUCTION.

Note—On the Wednesday following registration all Freshmen will write a preliminary English examination to determine their required English work. Those who prove to be seriously deficient will be registered only for English A; those less deficient will be registered for English I and English A; those who pass the examination satisfactorily will be required to take only English I and II. At the end of two weeks such readjustment of registration may be made as proves desirable.

A. CORRECT ENGLISH—Drill in spelling, punctuation, grammar and simple sentence structure. This course is provided for the assistance of any students deficient in these particulars and will be required of all Freshmen who fail to pass the preliminary examination in English or whose work in English I shows the necessity of this course.

First semester; no college credit.

I and II. FRESHMAN ENGLISH—Oral and written themes, outside readings; quotations. Required of all Freshmen. No credit for only English I, the course being continuous.

Both semesters; 3 credit hours; three recitations; three sections, with combined meeting of all sections, W. 4:00, at stated intervals and frequent individual conferences.

III. ADVANCED COMPOSITION—The style of two or three contemporary writers, remarkable especially for clearness, simplicity and ease, studied in class discussions and imitated in

frequent themes. Attention is principally centered upon vocabulary and sentence structure.

First semester; 3 credit hours.

IV. ADVANCED COMPOSITION—Course III continued, with special attention to the Short Story as illustrative of the principles of literary composition and criticism. Typical short stories are read and one or two imitated in original stories. Frequent short descriptive and narrative themes are required throughout the semester. Prerequisite: Course III.

Second semester; 3 credit hours.

IVa. SHORT STORIES—The reading and lectures of Course IV without the themes.

Second semester; 2 credit hours.

V. SHORT STORY WRITING—The writing of three original short stories and the study of stories in current magazines. Prerequisite: Course IV and the permission of the instructor.

First semester; 2 credit hours.

VI. TRANSLATIONS—Translations from foreign languages with special attention to the English version; lectures on the art of translation. Open only to advanced students in German, French or Latin, who have had Course III.

Second semester; 2 credit hours.

VII. DEBATE—A study of the principles of debating with regular practice in the outlining and briefing of arguments and in the actual work of team debating. Some experience in debating is required for admission.

First semester; 2 credit hours.

VIII. DEBATE—A course in practical debating including the development of briefs and set debates on political and governmental questions. Prerequisite: Course VII or its equivalent.

Second semester; 2 credit hours.

IX. ORATIONS—The study of typical orations and public speeches with the writing of original speeches.

First semester; 2 credit hours.

XI. INTRODUCTION TO LITERATURE—Elementary work in the essay, poetry, drama and fiction. Open to all students.

First semester; 2 credit hours.

XII. AMERICAN POETRY—Selections from the verse of American poets. (Open to all students.)

Second semester; 2 credit hours.

XIII. AMERICAN PROSE—A survey of American literary history, and the discussion of notable works in prose. Prerequisite: Courses I and II.

First semester; 3 credit hours.

XIVa. RENAISSANCE—An introduction to the literature and life of the period with wide reading in its minor writers. Prerequisite: Courses I and II.

First semester; 2 credit hours.

XIVb. RENAISSANCE WRITERS—Spencer, Bacon, Shakespeare, Milton. Prerequisite: Courses I and II; Course XIVa, advised.

Second semester; 3 credit hours.

XV. CLASSICAL PERIOD—Lectures and written reports. (Open to Third and Fourth year students.)

First semester; 3 credit hours.

XVI. EARLY NINETEENTH CENTURY POETS—Wordsworth, Coleridge, Southey. (Open to Third and Fourth year students.)

Second semester; 3 credit hours.

XVII. EARLY NINETEENTH CENTURY POETS—Shelley, Keats, Byron. (Open to Third and Fourth year students.)

First semester; 2 credit hours.

XVIII. THE ROMANTIC MOVEMENT—A lecture and reading course on the origins of Romanticism and on certain types of Romanticists. (Open to Third and Fourth year students).

Second semester; 2 credit hours.

XIX. NINETEENTH CENTURY PROSE—Carlyle, Ruskin, Eliot. (Open to Third and Fourth year students.)

First semester; 3 credit hours.

XX. LATER NINETEENTH CENTURY POETS—The critical study of selections from Tennyson, Browning, Rossetti, Swinburne, Kipling, Noyes and other contemporary poets. (Open to Third and Fourth year students.)

Second semester; 5 credit hours.

XXI. SHAKESPEARE—A careful and detailed study of some of Shakespeare's plays. (Open to advanced students.)

First semester; 3 credit hours.

XXII. SHAKESPEARE—A continuation of Course XXI.

Second semester; 3 credit hours.

XXIII. ENGLISH VERSE—Its principles, forms, and technic, with frequent exercises in verse writing. (Open to Third and Fourth year students.)

First semester; 2 credit hours.

XXIV. TYPES OF DRAMA—Its forms and technic with readings of typical plays from Sophocles to the present day as illustrative of the principles of drama. (Not open to Freshmen, except by special permission.)

Second semester; 2 credit hours.

XXV. DEVELOPMENT OF THE ENGLISH DRAMA—Typical English plays exclusive of Shakespeare from 1500 to the present time. Prerequisite: Course XXIV.

First semester; 2 credit hours.

XXVI. THE MODERN NOVEL—Lectures and reports; illustrations from the novels of Thackeray, Dickens, Stevenson,

Hardy, Galsworthy, Meredith, and other contemporary novelists. (Open to Third and Fourth year students.)

This course alternates with Course XXX.

Second semester; 2 credit hours. Omitted in 1913-14.

XXVII. OUTLINES OF ENGLISH LITERATURE—History and development of English Literature in outline. (Open to Third and Fourth year students.)

First semester; 1 credit hour.

XXVIII. HIGH SCHOOL ENGLISH—The problems and methods of High School English in Composition and Literature, based on a few typical classics. (Required for the Teacher's Certificate in English.)

Second semester; 2 credit hours.

XXIX. INTRODUCTION TO THE STUDY OF LANGUAGE—A brief study of the principal subjects of linguistic investigation; lectures, with papers on problems of present interest. (Open to Third and Fourth year students.)

First semester; 3 credit hours. Omitted in 1913-14.

XXX. CHAUCER—Selections from the Canterbury Tales studied as an introduction to Middle English. (Open to Third and Fourth year students.)

Second semester; 2 credit hours.

XXXI. ANGLO-SAXON—Grammar and reading. Primarily for graduates.

XXXII. ANGLO-SAXON—A continuation of XXXI.

Second semester; 3 credit hours.

XXXIV. OPEN LECTURES—Lectures on literary subjects of general interest, the subject changing from year to year. In 1912 the course dealt with the English Bible; in 1913 with the Modern Drama; in 1914 the subject will be Great Novels.

Second semester; 1 credit hour.

LI. READING—Voice building, enunciation; pronunciation; analysis and interpretation; reading of narrative and didactic styles.

First semester; 2 credit hours.

LII. READING—A continuation of LI. Analysis and interpretation of imaginative literature.

Second semester; 2 credit hours.

LIII. PUBLIC SPEAKING—The delivery of orations; extemporaneous speaking. (Open only to students who have had LI, LII or their equivalent.)

First semester; 2 credit hours.

LIV. PUBLIC SPEAKING—Course LIII continued.

Second semester; 2 credit hours.

LV. INTERPRETATION—Readings from standard plays

and from modern poets and story tellers. (Open only to students who have had LI, LII or their equivalent.)

First semester; 2 credit hours.

LVI. INTERPRETATION—Course LV continued.

Second semester; 2 credit hours.

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 of History, preferably the history of Europe; one course in history of German or French literature, and the following courses in the departments of Literature and English:

XXIX. Introduction to the Study of Language; 3 credit hours.

XXV. Development of the English Drama; 2 credit hours.

XXI. Shakespeare; 3 credit hours, or XVIII. The Romantic Movement; 2 credit hours.

Candidates for the Teacher's Certificate in this department must have completed the above requirements.

COURSES IN GERMAN.

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

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

Both semesters; 4 credit hours; M. T. W. Th., F. 8:30.

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

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

Ia and IIa. ELEMENTARY GERMAN—Prescribed for Freshmen engineers.

Both semesters; 3 credit hours.

IIIa and IVa. Continuation of Ia and IIa. Prescribed for Sophomore engineers.

Both semesters; 3 credit hours.

V. and VI. ADVANCED—Composition, conversation, sight reading; Max Mueller, Deutsche Liebe, Scheffel, Ekkehart, Goe-

the, 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.

IX and X. HISTORY OF GERMAN LITERATURE—An advanced course. Prerequisite, three years of German.

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

XI and XII. SCIENTIFIC GERMAN—A course for students majoring in science. (Open to all students.)

Three credit hours.

COURSES IN FRENCH

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

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

Both semesters; 4 credit hours; M. T. W. Th. F., 9:30.

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

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

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

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

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

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

IX and X. HISTORY OF FRENCH LITERATURE—An advanced course. Prerequisite, three years of French.

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

XI and XII. SCIENTIFIC FRENCH—Open to students majoring in science; 3 credit hours.

COURSES IN SPANISH.

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

Both semesters; 4 credit hours; M. W. F. and 1 hour; to be arranged.

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

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

PSYCHOLOGY AND EDUCATION

COURSES IN PSYCHOLOGY.

Students that wish to elect their major work in psychology should take courses I, II, III, V, VI and VII. After taking courses I, II and III the student may with the consent of the professor substitute other courses for V and VI, according as he is working toward pure philosophy or education. Courses IV and VIII are especially designed for teachers who wish to ground themselves in the principles of psychology and mental measurement. Courses V and VI are especially suitable for students of biology and sociology.

I and II. GENERAL PSYCHOLOGY—This course runs throughout the year and forms a general introduction to all the courses in psychology and serves as a prerequisite for the work in education. The work is given by text-book, lectures, class demonstration and assigned readings with written papers. It is open to all students that have done one year of university work.

Three credit hours; M. W. F., 9:30.

III. EXPERIMENTAL PSYCHOLOGY—The work of this course will consist of lectures and experiments in the phychological laboratory. There will be one lecture a week and two periods of two hours each in the laboratory. The experiments will cover perception, attention, memory, affective states, fatigue, etc. Open to all students that have taken courses I and II.

First semester; 3 credit hours; laboratory T. Th., 2:30-4:30.

IV. EXPERIMENTS IN MENTAL MEASUREMENTS—This is designed especially for teachers. The aim is to present experimentally the various methods of determining sensory and bodily defect and of measuring mental power. The plan is to establish in connection with the department a bureau of child study which shall be open to teachers and parents for determining the causes of poor work and retardation among pupils in school. All teachers are to be trained in mental measurements. The prerequisites are courses I, II and III.

Second semester; 2 credit hours. T. Th., 2:30-4:30.

V. GENETIC PSYCHOLOGY—This course is devoted to a study of mental evolution in animals and men and of the process of learning. An attempt is made to work out the various stages in the development of mind. The work will be given by lectures and selected readings with papers by the students.

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

VI. SOCIAL PSYCHOLOGY—A study of the psychological foundations of society. The main themes are the social instincts and emotions, the principles of leadership and the various factors in the environments of races that have been influential in

fixing the psychological characteristics of the same. The work will be given by lectures and readings with papers.

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

VII. PHYSIOLOGICAL PSYCHOLOGY—In this course the structure and functions of the nervous system are studied in relation to mental phenomena. The aim of the work is to show the foundations especially of the prasticity of the nervous system and the educability of the human being. Open to all students that have taken work in biology or the first year's work in general psychology. The work is given by lectures and demonstrations in the laboratory.

First semester; 2 credit hours; M. W., or W. F., 2:30-4:30.

VIII. MENTAL PATHOLOGY OR ABNORMAL PSYCHOLOGY—This course undertakes a study of the morbid phenomena of mental action. The work begins with a study of feeblemindedness in children and of insanity and criminality in adults and leads up to a study of hysteria, hypnotism, alternating personalities, loss of memory and other forms of common mental disorders. The work is given by lectures, readings and demonstrations in the state hospitals. Open to all students that have taken course VII and its prerequisites. This course is especially valuable for teachers as it presents the principles for interpreting backward children and cases of bodily arrest and mental retardation.

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

IX. PSYCHOLOGICAL SEMINARY—The seminary is open to all students of advanced attainments in psychology. The work will be chosen to suit the tastes and interests of those who wish to elect the course. In general it may be said that the aim is a systematic study of special themes in psychology. Admission by special permit.

Both semesters; credit and time to be arranged.

COURSES IN PHILOSOPHY.

XI. INTRODUCTION TO PHILOSOPHY—A study of the great problems in the development of thought and especially of present day problems of philosophical inquiry. Some text such as Paulson's Introduction to Philosophy will be used.

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

XII. ETHICS—A study of the principles of conduct and of moral living. The course will attempt to show the development of social living and to treat in view of their historical setting some of the more important social problems of the day such as individualism, socialism, the family and the production and distribution of goods. Dewey and Tufts' Ethics will be used as a text book.

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

XIII and XIV. HISTORY OF PHILOSOPHY AND OF ETHICS—This course will give a general survey of the development of philosophical thought and of ethical inquiry. The work will be given by lectures, assigned readings and class reports.

XVI. LOGIC—A study of the laws of thought and of the principles of reasoning and argumentation. The relation of scientific methods of investigation to mathematics and logic will find consideration in this course.

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

XVII. PHILOSOPHICAL SEMINARY—The work of this course will be arranged to suit the tastes and interests of the students who apply for admission and are doing their major work in philosophy.

Time and credit to be arranged with the professor in charge.

COURSES IN EDUCATION.

Note—The courses in General Philosophy or their equivalents are a necessary prerequisite to all work in education.

I. HISTORY OF EDUCATION—This course gives a general survey of the evolution of educational ideals and the development of school systems in their relation to the history of civilization from the period of the earliest cultural nations to the present time, including the history of education in America. First semester, ancient and mediaeval period; second semester, modern period.

Both semesters; 3 credit hours.

II. PRINCIPLES OF EDUCATION—The meaning of education will be considered from the standpoints of biology, anthropology, sociology, neurology, and psychology. Present day problems, and educational processes, aims and purposes and principles of general method will be considered in relation to their historic and scientific setting.

Both semesters; 2 credit hours.

III. EDUCATIONAL PSYCHOLOGY—The psychological facts and laws underlying learning and development will be considered. Special attention will be given to the nature of individual differences, and to the psychology of adolescence and child development.

First semester; 2 credit hours.

IV. 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, teacher's meetings, etc.

Second semester; 2 credit hours.

V. THE HIGH SCHOOL, ITS EVOLUTION, ORGANIZATION, MANAGEMENT AND PROBLEMS—The development of the American high school and of foreign secondary school systems will be studied to give perspective for a practical consideration of the problems of the high school and its place in the educational system. The psychology of adolescence, and the development of youth as related to such problems as attendance, interest, discipline, ideals, the formation of character, etc., will be considered.

First semester; 3 credit hours.

VI. OBSERVATION AND PRACTICE TEACHING—Lectures on the organization and administration of the high school. Systematic observation of class room work, weekly conferences for the discussion of observations. Preparation of lesson-plans and practice teaching under the supervision of the Department of Education and critic teachers. Carried on in co-operation with the Missoula County High School. Prerequisite: Fifteen hours in Education.

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

VII. SCHOOL HYGIENE—The hygienic aspects of school architecture and equipment and the more important aspects of mental hygiene of instruction, including such topics as tests of vision, hearing and fatigue, recreation, habits of study and teaching, the hygiene of the various school subjects, etc.

First semester; 2 credit hours.

VIII. EDUCATIONAL ADMINISTRATION—A course designed primarily for more advanced students. This will deal with administrative problems of city and county school systems and the administration of such specific types of education as high schools, normal schools, vocational education for defective and subnormal children. A special study of the methods and results of recent scientific studies of school administration will be made, including school finance; promotion, retardation and elimination; causes and conditions of efficiency in teaching; and the measuring of educational products.

First semester; 2 credit hours.

XIX and XX. PEDAGOGICAL SEMINARY—Designed for special students of education. Members meet once a week for discussion of a general topic selected at the beginning of each semester. A part of the time will be given to a critical consideration of current technical educational literature.

By special arrangement; 1 or 2 credit hours; time to be arranged.

SUGGESTIVE SCHEDULE OF COURSES FOR PROSPECTIVE TEACHERS

FIRST YEAR'S WORK.

First Semester, 15½ Hours		Second Semester, 15½ to 18½ Hours	
Science or Mathematics	3 to 5 hours	Science or Mathematics	3 to 5 hours
Language	5 hours	Language	5 hours
English	2 hours	English	2 hours
Gymnasium	½ hour	Gymnasium	½ hour
History or Economics	3 hours	History or Economics	3 hours
Electives	2 hours	Electives	2 to 3 hours

SECOND YEAR'S WORK.

First Semester, 15½ to 18½ Hours.		Second Semester, 15½ to 18½ Hours.	
Language	3 to 5 hours	Language	3 to 5 hours
Literature or Philosophy	3 hours	Literature or Philosophy	3 hours
Psychology	3 to 5 hours	Psychology	3 to 5 hours
Electives	2 to 5 hours	Electives	2 to 5 hours
Gymnasium	½ hour	Gymnasium	½ hour

THIRD YEAR'S WORK.

First Semester, 15 to 18½ Hours.		Second. Semester, 15 to 18½ Hours.	
Major Subject	5 to 8 hours	Major Subject	5 to 8 hours
History of Education	3 hours	History of Education	5 hours
Principles of Education	2 hours	Princiles of Education	3 hours
Electives	5 to 8½ hours	Educational Psychology	2 hours
		Electives	5 to 8½ hours

FOURTH YEAR'S WORK.

First Semester, 15 to 18½ Hours.		Second Semester, 15 to 18½ Hours.	
Major Subject	5 to 8 hours	Major Subject	5 to 8 hours
Special Method	2 hours	Special Method	2 hours
School Hygiene	2 hours	Observation Work	5 hours
High School	3 hours	Electives	5 to 5½ hours
Electives	5 to 5½ hours		

HISTORY AND ECONOMICS

MAJOR REQUIREMENTS.

Thirty hours of courses may be offered as a major. These hours may be offered in either History or Economics. Major work in one subject must be accompanied by minor work in the other. Students who make History or Economics a major should study Modern Languages. Students of Economics and Sociology are recommended to study Mathematics, Biology and Psychology.

Candidates for the Teacher's Certificate in History are required to complete courses I-VI and VII-VIII or IX in History.

COURSES IN HISTORY.

I. MEDIAEVAL EUROPEAN HISTORY—The history of continental Europe in the Middle Ages to the Thirty Years' War. Especial attention is given to the influence of Roman civilization, the Christian church, and the German people in the development of modern Europe, and to the Renaissance and Reformation as a period of transition.

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

II. MODERN EUROPEAN HISTORY—A study of the modern European state system. The ascendency of France, the rise of Prussia, the revolutionary and Napoleonic eras, the unification of Germany and Italy, and the progress of democracy and social reform in the nineteenth century.

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

III. HISTORY OF ENGLAND—A course in the constitutional, political and institutional history of England to the close of the Tudor period. Feudalism, manor and gild, development of law, origin and growth of parliament; intellectual and social history; causes and results of the reformation movement.

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

IV. HISTORY OF MODERN ENGLAND—Struggle of king and parliament in seventeenth century; constitutional, political, and religious questions of modern England; expansion of England; commercial and industrial development; democratic and social movements of nineteenth century.

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

V. AMERICAN HISTORY—The colonies and Revolution. Beginnings of American nation; European influence; development of American institutions; provincial America; French and English rivalry; colonial government; causes of Revolution; independence, the Confederation and Constitution.

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

VI. AMERICAN HISTORY—Organization of the government; rise of nationality; territorial expansion; growth of de-

mocracy; the slavery controversy; Civil War and Reconstruction; recent development.

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

VII. THE RENAISSANCE—Political, economic and intellectual conditions at close of Middle Ages; the papacy; beginnings of the Renaissance; geographical discoveries; inventions; Greek influence; a detailed study of the intellectual ideas of the Renaissance.

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

VIII. THE REFORMATION—Social and ecclesiastical conditions underlying the reformation; reform within and without the church; Luther and the reformation in Germany; religious wars; importance of the Reformation.

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

IX. REVOLUTION AND NAPOLEONIC ERAS—French society and state before the revolution; estates general; reign of terror and reaction; Constitution of 1795 and Directory; Napoleon and the Empire; Napoleonic wars and the commercial struggle with the British Empire.

First semester; 3 credit hours; T. Th., 9:30.

X. EUROPE IN THE NINETEENTH CENTURY—A detailed study of the political and social conditions of Europe since 1815. Period of reaction and revolution; unification of Germany and Italy; development of the British Empire; international relations; arbitration and world politics.

Second semester; 3 credit hours; T. Th., 9:30.

XV. AMERICAN GOVERNMENT—A study of the organization, functions, and powers of national, state, and municipal government in America. Especial attention will be paid to state and municipal government in Montana.

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

XVI. AMERICAN POLITICS—Political parties and party problems in the United States. A study of the origin, and principles of political parties, and their functions in the American system of government.

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

COURSES IN ECONOMICS.

I and II. ECONOMICS—The historical analysis of industry and property; the development of the modern industrial organization; the processes of the production and the distribution of wealth; the laws of profits, interest, rent and wages; the relation of recent economic changes to the fundamental laws of economics; illustration of economic principles from current economic life.

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

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

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

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

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

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

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

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

VI. TRUST PROBLEM—The causes and the development of monopolistic industrial organization; the organization and methods of trusts; legislation affecting trusts; the control of monopoly, legal and social.

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

VII and VIII. SOCIOLOGY—A study of the development of the social organization, in four parts. (1) Primitive society and fundamental social factors; (2) the development of civilization and of democracy; (3) social psychology and social control; (4) social policy and the principles of orderly progress.

First and second semesters; 2 credit hours; T. Th., 9:30.

IX and X. SOCIAL AND ECONOMIC PROBLEMS—An application of the principles of economics and sociology to the study of current questions and institutions; theories and institutions for the betterment of economc and social organization, "individualism," socialism, the development of industrial organization, corporations and labor unions; legislation affecting industry and property; philanthropy; the church and social problems, social settlements; social education, constructive philanthropy. Prerequisite: One year in history and economics.

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

XI-XII. SEMINAR—Studies in selected topics, and the discussion of student researchers.

Both semesters; 2 credit hours; T. Th., 11:30

LIBRARY SCIENCE

COURSES OF INSTRUCTION.

The purpose of these courses is to give students systematic instruction in the use of the library. An effort is made to familiarize the student with such catalogues, bibliographical aids and general reference books as will enable him to investigate a subject with intelligence.

GENERAL REFERENCE—Lectures, reading and reference work. Lectures will be given on the following topics: The arrangement of the library and the privileges granted students, the use and value of the card catalogue, dictionaries and encyclopedias, Poole's index and periodical literature, classification, cataloguing, atlases and gazeteers, note-taking, book-binding and the care of books, government publications, and reference books on English and American literature, history and science. One lecture or recitation per week. One afternoon laboratory work. One hour credit. Either semester.

SPECIAL TRAINING 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.

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.

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.

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.

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

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 must take thirty-two hours. Ten additional hours selected from the departments of Literature, History, Languages, Philosophy and Sociology are advised.

Candidates for the Teacher's Certificate must have completed acceptably courses III, IV, V, VI, VIII, IX, XI, XIII, XIV, XV, XVI.

COURSES IN HISTORY AND APPRECIATION.

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

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

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

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

III. HISTORY OF RENAISSANCE ART—A study and comparison of the Italian schools of Sculpture and Painting.

First semester; 2 credit hours. Omitted in 1913-14.

IV. HISTORY OF RENAISSANCE ART—A study and comparison of the German, French and Dutch schools of painting.

Second semester; 2 credit hours. Omitted in 1913-14.

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

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

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

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

COURSES IN REPRESENTATION.

VII. ELEMENTARY DRAWING AND PAINTING—An introductory course in free-hand drawing and painting.

First semester; 2 credit hours; T. Th., 1:30-4:30, or S., 8:30-12:30.

VIII. TECHNICAL TRAINING IN REPRESENTATION—Practical work in painting and modeling. Choice of mediums, oil, water color, or clay. Work from still life, cast, landscape and life. Prerequisite: Course VII.

First semester; 2 credit hours; T. Th., 1:30-4:30, or S. 8:30-12-30.

IX. TECHNICAL TRAINING IN REPRESENTATION—A continuation of Course VIII.

Second semester; 2 credit hours; T. Th., 1:30-4:30, or S. 8:30-12:30.

X. TECHNICAL TRAINING IN ILLUSTRATION—The object of this course is to prepare students to do practical illustration for books, magazines or newspapers. Special attention will be given to pictorial composition and methods of reproduction. Prerequisite: Courses VII, VIII, IX.

Second semester; 2 credit hours; T. Th., 1:30-4:30, or S., 8:30-12:30.

COURSES IN DESIGN.

XI. HOME DECORATION—An introductory course in home decoration, in which aesthetic principles are applied to the construction and embellishment of the home. This course will consist of two lectures and one laboratory period a week.

First semester; 3 credit hours; M. W., 10:30, M. or W., 1:30-4:00.

XII. HOME DECORATION—A continuation of Course XI.

Second semester; 3 credit hours; M. W., 10:30; M. or W., 1:30-4:00.

XIII. PRACTICE IN DESIGN—The essential principles of design.

First semester; 2 credit hours; M. W., or F., 1:30-4:30.

XIV. APPLIED DESIGNING—Applications in metal and leather.

Second semester; 2 credit hours; M. W., or F., 1:30-4:00.

XV. APPLIED DESIGN—A continuation of Course XIV.

First semester; 2 credit hours; M. W., or F., 1:30-4:00.

XVI. THE TEACHING OF ART—A course planned for supervisors and instructors in drawing, painting and design. The work will include a general survey of the methods of presenting the subject, practical exercises, and definite plans for the organization of courses. Prerequisite: Courses VII, VIII, IX, XIV, XV.

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

MUSIC

The Department of Music offers instruction in instrumental and vocal music.

Piano courses include major and minor scales in octaves, thirds, sixths, legato and staccato. Daily exercises by Clemence Schultz, etudes by Loeshorn, Heller, Bertini, Czerny Op. 299 and the Art of Finger Dexterity, Cramer Etudes (Buelow Ed.), Clementi, Gradus ad Parnassum, Moscheles Etudes, Mozart and Beethoven Sonatas and different classic and modern compositions.

Violin courses include Violin schools by Ries, Parts I and II; Sevcik, Op. 6 (Parts I-VII); Etudes by Gruenwald (50 Etudes); Kayser (Parts I, II, III); Mazas, (Parts 1 and II); Kreutzer, Fiorillo and Rode, Etudes; Sevick, Op. 2, 3, 7, 8, 9; different classic and modern solos.

Chamber music recitals and concerts are given by the department at various times during the year. The students' orchestra furnishes music for various college functions.

By resolution of the Faculty a total of eight credits toward graduation may be allowed for music.

The University Orchestra, Glee Club and Sextette offer opportunities for careful instrumental and vocal training, and pupils sufficiently advanced in this department may join the Philharmonic Society. This society, under the direction of Professor Fischer, gives concerts during the year in Assembly Hall.

Fees.

Piano, one lesson a week .....$20 per semester
Violin, one lesson a week..... ..$20 per semester

PHYSICAL EDUCATION

The Department of Physical Education has charge of all athletics of the University and directs the courses in Gymnasium work. At the beginning and end of each school year a physical examination is given each student and suitable exercises are prescribed for his development. The cards given to each person examined give him an opportunity to compare his development with that of the average man and also his increase in strength during the year.

The University requires that each student must have two credits in Physical Culture listed with the total number for a degree. This work is given in the Freshman and Sophomore years, but where the student has a satisfactory reason this may be postponed until a more convenient time. One half a credit a semester is given for the regular gymnasium work and the student is required to spend two hours a week during the semester to receive this credit. When men are engaged in competitive

sports they may be excused from the gymnasium classes by applying to the Director of Physical Education.

The expenses of a gymnasium course are about three dollars, each student being required to purchase a regulation uniform.

COURSES FOR MEN.

I and II. Setting up exercises and special exercises for building up the body; elementary exercises on the horizontal bars, parallel bars, buck, etc.

Both semesters; ½ credit hour; time to be arranged.

III and IV. Advanced work on the apparatus, club swinging, etc.

Both semesters; ½ credit hour; time to be arranged.

COURSES FOR WOMEN.

V and VI. Exercises without apparatus; breathing exercises, walking and running; dumb bells; exercises for rhythm; the latter including folk games and dances. This work is taken by all undergraduate women during the first year of their attendance at the University.

Both semesters; ½ credit hour; two sections; time to be arranged.

VII and VIII. Exercises with chest weights, wands, bar bells, dumb bells, Indian clubs, rubber balls, games, advanced work in rhythm, including folk games and dances, and gymnastic dancing.

Both semesters; ½ credit hour; time to be arranged.

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, course XII and ten semester hours from the remaining courses. Choice of restrictive electives should include one year of Physics, two years of German and one year of French.

Candidates for the Teacher's Certificate must fulfill major requirements.

COURSES OF INSTRUCTION.

Note—Course Ib 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.

A. SOLID GEOMETRY—This course is offered to accommo-

date students entering without solid geometry, and who need mathematics for their work in the sciences or technical departments.

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

Ia. 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.

First semester; 2 or 3 credit hours; section I, T. Th., 8:30; section II, M. W. F., 9:30; also second semester, T. Th., 10:30.

Ib. MATHEMATICS (Algebra, Elements of Analytic Geometry and Calculus.)—An elementary treatment of methods of elimination, including the principal theorems of determinants; graphical representation of functions with applications to statistical and scientific data; algebraic polynominals, including the geometry of the straight line and some of the more important theorems of the theory of equations; differentials of the polynominal in one variable, including problems on tangents, normals, maxima and minima and points of inflection.

First semester; 3 credit hours; M. W. F., section I, 8:30; section II, 9:30.

IIa. ELEMENTARY ANALYSIS—A brief course in the elements of analytic geometry and calculus. This course is designed for students desiring some training in mathematics, but not wishing to major in the subject. Prerequisite: Trigonometry.

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

IIb. 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; 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.; Section I, 8:30; section II, 9:30.

III. MATHEMATICS (Integral Calculus.)—This course covers the following subjects: Elementary formula of integration; definite integrals; integration a process of summation; Taylor's and Maclaurin's series; applications to areas and lengths of plane

curves, volumes of solids; integration of simple differential equations.

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

IV. MATHEMATICS (Solid Analytic Geometry, Calculus, Differential Equations.)—This course is a continuation of course III. It covers the following subjects: Elements of solid analytic geometry, partial differentiation, multiple integration, infinite series, indeterminate forms, and differential equations.

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

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

First semester; 3 credit hours; T. Th. S., 9:30.

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

Second semester; 3 credit hours; T. Th. S., 10:30.

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

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

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

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

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

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

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

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

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; 3 credit hours; T. Th., 8:30; S., 10:30.

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 text-books; correlation of mathematics with allied subjects; laboratory, mathematics. Prerequisite: Course IV.

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

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

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

XIV. ASTRONOMY—A short course for engineers. Determination of latitude, azimuth, and time with emphasis laid on those methods which the engineer will be able to use with the surveyor's transit.

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

XV. METHOD OF LEAST SQUARES AND THE PRECISION OF MEASUREMENTS—A discussion of the nature and methods of elimination of errors, adjustment of observations, and empirical equations. Designed for students in engineering and physics. Prerequisite: Course III.

First semester; 2 credit hours.

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

Second semester; 3 credit hours; omitted in 1913-14.

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

First semester; 3 credit hours; omitted in 1913-14.

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; 3 credit hours; omitted in 1913-14.

XIX. SEMINAR—Course XIX is open to those who have completed courses Ia, Ib, II, III, IV.

Both semesters; credit and time to be arranged.

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 Function, Differential Geometry.

BIOLOGY

MAJOR REQUIREMENTS.

Students doing their major work in Biology will be required to take courses I to VI, inclusive, and Seminar work during the senior year to the amount of four credit hours. They must also take two years of Modern Language and one year of Botany.

COURSES OF INSTRUCTION.

I. GENERAL BIOLOGY—An introduction to the study of living things, illustrated by a study of invertebrated animals, and dealing with the fundamental laws governing living organisms. The course consists of text book study, lectures, library references and laboratory work, the latter requiring one-half of the time. In the laboratory attention is given to manipulation of apparatus as well as to the study of specimens. The work of the first semester deals with the lower forms of life from Protozoa to Arthropoda, and includes a study of the structure, habits and distribution of the animals from the zoological standpoint. The idea of development according to evolution is kept prominent, and a consistent effort is made to stimulate and develop powers of thought. This and course II make a continuous course for the year. Open to all students.

First semester; 4 credit hours; lecture T. Th., 10:30 and one other period to be arranged. Laboratory, M. W. or T. Th., 1:30.

II. GENERAL BIOLOGY—A continuation of the preceding, but dealing largely with the vertebrates. During the spring excursions are taken and study made of local animals as they live in the environment furnished by the locality. Attention is given to the local fauna and its origin. Open to all students.

Second semester; 4 credit hours; lecture, T. Th., 10:30; Laboratory, two afternoons, M. W., or T. Th.

III. ANIMAL ECOLOGY—The work of the course deals with the relationship of animals to their surroundings, adaptability of structure to modes of life, the effects of climatic and other conditions upon growth and structure, and like topics. The museum collections will be extensively used both in the laboratory and to illustrate the lectures. The study will consist of lectures, recitations, library and laboratory work, with field excursions. Prerequisite: Biology I and II.

First semester; 4 credit hours; lecture and recitation, T. Th., 8:30; laboratory, time to be arranged.

IV. ANIMAL ECOLOGY—This is a continuation of Course III and with it makes a continuous study for a year. During this semester attention will be devoted to distribution, isolation and migration. leading to an understanding of the origin of the present fauna in various places on the earth.

Second semester; 4 credit hours; lecture and recitation, T. Th., 8:30; laboratory, time to be arranged.

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

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

VI. PROTOZOOLOGY—A study of the life history of Protozoans and their relation to diseases. May be taken with or without laboratory work. Prerequisite: Biology I and II.

Second semester; 2 to 4 credit hours; lectures and recitations T. Th., 8:30; laboratory, time to be arranged.

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

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

VIII. ENTOMOLOGY—A continuation of course VII. Outdoor work will be required when the season opens. The collections must be identified, labelled and properly prepared for the cabinet. Much time will be given to injurious insects. Open to all students, but must be preceded by VII.

Second semester; 3 to 5 credit hours; recitation, M. F., 9:30; laboratory, time to be arranged.

IX. BACTERIOLOGY—A general course, dealing with the general phases of the subject, such as culture media, sterilization, methods of staining and mounting, beneficial and pathogenic bacteria. Lectures and recitation, with laboratory. Prerequisite: Familiarity with the miscroscope, and general chemistry.

First semester; 5 credit hours; lecture, T. Th., 9:30; laboratory, time to be arranged.

X. THE HUMAN BODY—Advanced study for mature students, following the work as outlined in Martin's Human Body. Recitations, with or without laboratory.

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

XI. PHOTOGRAPHY—A study of lenses, cameras, paper, development, 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 requisite for admission. No attempt is made at portraiture. The subject must be chosen for the year.

First semester; 2 credit hours; lecture F., 8:30; laboratory, F., 1:30.

XII. PHOTOGRAPHY—Continuation of XI, which is a prerequisite. Laboratory work with class demonstrations or lectures. Each student works alone at hours to be arranged.

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

XIII. BIOLOGICAL SEMINAR—Reviews of current and recent literature intended to give a comprehensive survey and knowledge of the trend of thought and study in biological studies. Continued during the second semester. Open to all advanced students and required of all students doing major work in the department.

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

XIV. BIOLOGICAL SEMINAR—A continuation of Course XIII. A thesis will be required of all seniors, involving a study of some phase of animal life and requiring investigation on the part of the student.

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

XV. RESEARCH—An opportunity will be given to graduate students and others of sufficient fitness to pursue original investigations within the facilities of the department as to laboratories and material. Details will be arranged with individual students.

Both semesters; credit and time to be arranged.

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

BOTANY AND FORESTRY

MAJOR REQUIREMENTS.

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

Candidates for the Teacher's Certificate in this department must have completed acceptably courses I, II, III, IV.

Students doing their major work in Forestry are referred to the schedule of courses elsewhere suggested for five years' work.

COURSES IN BOTANY.

I. GENERAL BOTANY—This course is offered with the object of giving a general review of the vegetable kingdom. It consists of lectures and laboratory work on typical plants representing the various natural groups, such as the algae, fungi, mosses, ferns, etc. The work of the first semester deals with the lower forms of plant life up to the ferns, and will involve a study of the

form, structure and habits of these plants from the standpoint of adaptation, and of their relationship from the standpoint of evolution. This course forms with II the continuous work of a year.

First semester; 3 credit hours; T., 9:30; laboratory, M. W., 1:30.

II. GENERAL BOTANY—The second course takes up the seed plants from the same points of view as course I. Typical members of various families and genera are studied, outlining the classification of the principal groups. Field trips will constitute a part of the work.

Second semester; 3 credit hours; T., 9:30; laboratory M. W., 1:30.

III. PLANT HISTOLOGY—A study of the structure of plants from a morphological standpoint, including the development of organs and the differentiation of tissues. This course furnishes also an introduction to the methods of microtechnique. Students are enabled to obtain a collection of slides for their own use. Prerequisite: Botany I and II, or Biology I and II, or equivalent.

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

V. SYSTEMATIC BOTANY—Under this title is treated the classification of flowering plants. The purpose of this course is to familiarize the student with the characters of the principal families of this group, especially those represented in the western flora. The course also treats of the distribution and relationship of the species. Prerequisites: Botany I and II, or equivalent.

Both semesters; credit and time to be arranged.

VI. SYSTEMATIC BOTANY—Critical studies of more or less restricted groups. This may include work upon the lower orders of plant life. Prerequisite: Botany V.

Both semesters; credit and time to be arranged.

VII. BOTANICAL SEMINAR—Reviews of recent literature designed to give an outlook upon the field of botanical science and forestry.

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

VIII. BOTANICAL SEMINAR—A continuation of course VII. A thesis will be required upon some topic in connection with the work involving a critical survey of botanical literature in some special line.

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

Note—Courses VII and VIII are open only to seniors, but are required of all students doing major work in the department.

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

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

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

Both semesters; credit to be arranged.

COURSES IN FORESTRY.

I. ECONOMICS OF FORESTRY—Lectures on the forests in their relation to the welfare of the nation. The distribution of forests, their utilization and treatment, the National Forests, the work of the Forest Service, and the development of the present conservation policy in relation to forests, are subjects included in this course, which is designed to be cultural in character. Open without prerequisite.

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

II. FOREST PRODUCTS—Lectures on the methods of utilizing forests in the production of commodities other than lumber, viz; Naval stores; tanning extract, paper, shingles, cooperage stock, fiber, gums, etc. Attention will also be given to the economic importance of the various products.

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

III. DENDROLOGY—The work contemplated under this subject is the study of the classification of the forest trees of the United States and Canada, their form, characteristics and distribution, and the morphological features upon which their classification is based. Special attention is given to western species.

First semester; 4 credit hours; M. W., 10:30; laboratory, T. Th., 1:30.

IV. FOREST ECOLOGY—The side of forest botany presented in this course deals with the effect of climate and soils upon distribution, local and general, and such factors as have to do with the growth and life histories of different species.

Second semester; 4 credit hours; M. W., 10:30; laboratory, T. Th., 1:30.

V. STRUCTURE AND CLASSIFICATION OF WOODS—Lectures and laboratory work on the structure and physical properties of woods; identification of woods and examination of gross and microscopic structure; the uses of various woods, their durability, preservation, etc.

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

VI. FOREST PATHOLOGY—A course dealing mainly with diseases of timber, their recognition and treatment. The various organisms which affect living trees and structural timbers studied from a systematic and biological standpoint. Lectures, laboratory and field work.

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

A detailed description of the courses in silviculture, management, lumbering, etc., is omitted at this time. A fuller announcement, embodying these features, will be issued later.

FORESTRY OPPORTUNITY IN MONTANA.

By an act of the Thirteenth Legislative Assembly (1913) a State School of Forestry has been established at Missoula, as a department of the University of Montana. This will enable the University to offer two years of professional training, following three years of study of those subjects which naturally underlie an education in technical forestry. The course as planned follows largely the recommendations of the Committee of the Conference of Forest Schools on the Standardization of Instruction in Forestry, and is essentially the same as the courses now offered at the larger forest schools of the country.

This action of the Legislature of Montana recognizes the need of western schools for western men. The West has its own forest types, and its peculiar forest problems; the most efficient man in western forestry, other things being equal, is the man familiar with western conditions by experience and training. The development of the lumber industry in Montana and in other parts of the West, the boundless timber resources of the Pacific Slope, and the location of the great national forests, all point to the conclusion that the West is to be, in the not distant future, the scene of the principal forestry education and practice of the nation.

Missoula is located in one of the most instructive forest areas to be found in the whole Rocky Mountain region. The variations of topography and of other influential factors afford a large variety of conditions of interest to the student of forestry. The nature of the adjacent country also affords opportunities for the practical application of forestry in remunerative employment; and many students are thus occupied during the months of the summer vacation.

The special opportunities for the study of forestry at the State University consist not only in the courses offered, but also in the location of the University with reference to the operations of the United States Forest Service. The headquarters of District Number 1 are in the City of Missoula. Several of the National Forests are within easy reach of the University. Thus the practical operations of the Service are available for study the year round, and the valuable assistance of its expert officers has been freely given in lectures and other ways of practical value to the student of forestry.

The University is also looking to the establishment of a course in Lumbering and Forest Management for training men to organize and conduct large operations in logging and milling and at the same time to give efficient management to extensive tracts of forest land. This requires technical training in silviculture, forest managmeent, and in engineering. Students intending to specialize in lumbering should early consult the head of the department for direction in the planning of the course of study.

THE REQUIREMENT IN FORESTRY.

The following schedule of courses is required of all desiring to specialize in forestry. Changes arising from conflicts of hours, or for other reasons, may be announced later.

PRE-FORESTRY COURSE.

FIRST YEAR.

First Semester	No. of Course	Credits	Second Semester.	No. of Course	Credits
English	I	3	English	II	3
Mathematics	Ia & b	5	Mathematics	IIb	5
Biology	I	4	Biology	II	4
Chemistry	I	4	Chemistry	II	4
Drawing		2	Drawing		2
Physical Culture..	I	½			

SECOND YEAR.

First Semester.		Second Semester.	
American History. V	3	American History. VI	3
Botany I	3	Botany II	3
Economics I	3	Economics II	3
Geology (Physiog). V	2	Surveying	2
Physics I	4	Physics II	4
Restricted Elective	3	Restricted Elective	3
Physical Culture...III	½	Physical Culture...IV	½

THIRD YEAR.

First Semester.		Second Semester.	
German I	5	German II	5
Botany III	3	Botany IV	3
Applied Mechanics.	3	Applied Mechanics.	3
Surveying	2	Surveying IIIc	2
Physics (Meteor).XXI	3	Mineralogy X	3
Forestry I	2	Forestry II	2

FOURTH YEAR.

First Semester.		Second Semester.	
Dendrology III	4	Forest Ecology.....IV	4
Materials Const.	3	Wood Technology	3
Mensuration	4	Lumbering	4
Forest Pathology	3	Forest Protection	3
History of Forestry....	2	Forest Law	2
Grazing	2	Railroad Surveying ...	2

FIFTH YEAR.

First Semester.		Second Semester.	
Silviculture	4	Silviculture	4
Lumbering	4	Lumbering	4
Management	4	Management	4
Forest Policy	2	Forest Administration..	3
Structural Engineering.	2	Seminar and Thesis....	3
Seminar	2		

SHORT COURSE IN FORESTRY

CHARACTER OF THE SHORT COURSE.

In co-operation with the officials of the Forest Service, the University of Montana provides a short course in Forestry which is open to men in the Service, and to others who may wish to apply. This course covers about twelve weeks, beginning about the 1st of January and closing in March. Instruction is given by members of the University faculty, with special lectures by officers of the Service.

It is the purpose of the Short Course to offer such studies as will be most serviceable to the ranger in his work, or, in other words, to provide an opportunity whereby employes of the Service may obtain the knowledge required of them in the satisfactory discharge of their duties. Advancement is won by ambition and energy wisely directed, and the Short Forestry Course gives men the chance to increase their knowledge and consequently their efficiency in the business which concerns them. While the course is planned primarily for men in the Service, it is also of great value to those wishing to obtain permanent positions with the Government, and who are preparing to pass Civil Service examinations. It is likewise of importance to any who, for whatever reasons, may desire a brief and practical course in Forestry.

The Short Course is open to all men nineteen years of age and upwards, who give evidence of their ability to carry on their studies successfully. The studies offered are such as can be carried by anyone having a common school education. No previous special training is required. No man of serious purpose need fail to understand all of the subjects presented.

The expenses of the course are very small. No tuition is charged. A laboratory fee of $3.00 is required, to cover incidental expenses. A nominal matriculation fee of $2.00 is also required. Board and room can be obtained in Missoula at from $25.00 to $30.00 per month. For the last session a fare and a third was granted by the railroads from all points on main and branch lines in Montana and Idaho.

STAFF OF INSTRUCTION IN SHORT FORESTRY COURSE, 1913.

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

L. C. PLANT . . . . Professor of Mathematics
Mathematics, Mensuration.

W. R. PLEW . . Assistant Professor of Civil Engineering
Surveying.

ROBERT N. THOMPSON . Assistant Professor of Physics
Physics.

E. F. A. CAREY . . . . Instructor in Mathematics
Trigonometry.

W. H. INBUSCH . . . . Assistant in Engineering
Surveying (Field Work).

LECTURERS.

C. H. ADAMS . Assistant District Forester, District No. 1
Grazing Administration.

R. B. ADAMS . . . . . .
Superintendent of Telephone Construction, Forest Service, District No. 1.
Telephone Construction.

F. E. BONNER . . Chief of Geography, District No. 1
Forest Maps.

DONALD BRUCE . . Forest Assistant, District No. 1
Reconnoissance.

H. H. FARQUHAR . . Forest Assistant, District No. 1
Planting.

C. W. JUNGBERG . . . State Forester of Montana
Principles of Forestry.

M. E. KNOWLES . . State Veterinarian of Montana
The Recognition and Treatment of Communicable Diseases of Animals.

D. T. MASON . Assistant District Forester, District No. 1
Sale Policy, Mensuration.

J. F. PRESTON . Assistant District Forester, District No. 1
Fire Protcetion.

SHORT COURSES OF INSTRUCTION.

The short courses of instruction as outlined below are designed to occupy fully a student's time during the session. The schedule is arranged with the intention of giving the greatest amount of practical information in the least time.

DENDROLOGY—This course deals with the classification of trees, their habitats and geographical distribution. Lantern slides and other material are used for illustration. Texts, Sargent's Manual of Trees of North America, Sudworth's Trees of the Pacific Slope. Two hours.

SILVICULTURE—The work in silviculture considers the relation of forests to factors of soil and climate, the influence of water, light, temperature, etc., on the growth, form and distribution of trees. Text, Graves' Principles of Handling Woodlands. Two hours.

FOREST PATHOLOGY—A discussion of the diseases of living trees, their recognition and treatment. Consideration also of organisms effecting the destruction of manufactured lumber, structural timbers, etc.; methods of preservation of woods. Two hours.

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

TOPOGRAPHIC SURVEYING AND DRAFTING—A course to train men for the work of topographic surveying. Instruction in the use of the proper instruments of such work; preparation of contour maps; assignment of special work on local topography Two hours.

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

MATHEMATICS II—Trigonometry in relation to surveying, and other engineering requirements of a forester's work. Two hours.

PHYSICS—The course will consist of lectures and demonstrations of the more elementary principles of physics related to the subject of forestry. This course is intended for those foresters who have not had high school physics or its equivalent. Two hours.

In addition to the regular courses of study, special work may usually be arranged in the various departments of the University.

GEOLOGY

MAJOR REQUIREMENTS IN GEOLOGY.

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

MINING AND ECONOMIC GEOLOGY.

The work given under this head will comprise courses in Chemistry, Physics, Civil and Mechanical Engineering, together with several courses in Geology, besides the regularly required University work. Students wishing to become mining or economic geologists will find given in the University, work ar-

ranged especially for this profession. The Department of Geology, through the summer collection trips, has geologic material from almost every portion of the state. Many trips are taken during the college year to nearby mines and economic deposits. Much systematic and carefully planned work is undertaken by the student during his work in the department. While no definite course of studies is outlined here, the department has arranged a course thoroughly preparing students for work in mining or economic geology. Situated as the University is, between the great copper mines at Butte and the rich silver and lead deposits of the Coeur d'Alene district, Idaho, the students of economic geology are favorably located for practical field work. The Department of Geology is well equipped in library and laboratory facilities to give thorough work in the subjects offered. As Montana, or rather the great Rocky Mountain region, is noted for its wonderful geologic products, the study of mining or economic geology in this state is of prime importance.

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, however, one afternoon in the week will be required in the laboratory. The lectures will be illustrated by lantern slides, stereographs, charts, relief maps, minerals and rocks from many localities. It is intended to be largely a cultural course, and is open to all students. Text, Chamberlin and Salisbury's College Geology.

First semester; 3 credit hours; lecture, M. W., 9:30; laboratory, M. or F., 1:30-4:00.

Ia. ENGINEERING GEOLOGY—A course arranged primarily for students in the Engineering School; and devoted to the study of dynamic and structural geology, together with laboratory work on rocks, minerals and soils.

First semester; 2 credit hours; lectures, T. Th., 9:30; laboratory, M., 1:30-4:00.

II. GENERAL GEOLOGY—A continuation of course I. The study of historical geology by means of lcetures, laboratory and field work. Text, Chamberlin and Salisbury's College Geology.

Second semester; 3 credit hours; lectures, M. W., 9:30; laboratory, M. or F., 1:30-4:00.

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

First semester; 2 credit hours; lectures, M. W., 10:30; laboratory, M., 1:30-4:00.

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; lectures, M. W., 10:30; laboratory, M., 1:30-4:00.

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

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

Va. GEOGRAPHY AND GEOLOGY OF MONTANA (Lectures and Field work.)—The object of this course is to give the student a general survey of the geological formations and products of the state, and a careful study of its geography. The mountains, rivers, valleys and their products will be studied, together with railroad maps, weather maps, topographic maps, rainfall charts, temperatures charts, etc. Every student in the University should be more or less familiar with the geography and general natural products of the state. This course is intended to give a general survey along this line.

First or second semester; 2 credit hours.

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

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

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

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

VIII. HISTORY OF GEOLOGY—This course is intended for those specializing in geology. The basis of the course will be, "Founders of Geology," by Geikie; "History of Geology and Paleontology," by Zittel.

Second semester; 2 credit hours.

MAJOR REQUIREMENTS IN MINERALOGY AND ECONOMIC GEOLOGY.

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

COURSES IN MINERALOGY AND ECONOMIC GEOLOGY.

IX. PHYSICAL MINERALOGY (ELEMENTARY CRYSTALLOGRAPHY AND PHYSICAL MINERALOGY).—A study of the elements of crystallography and the identification, by means of physical characters and chemical tests, of 150 common minerals. Text, Rowe's Elements of Crystallography and Mineralogy. Prerequisite: Chemistry I and II or equivalent.

First semester; 3 credit hours; lectures, T. Th., 9:30, laboratory, T. Th., 1:30-4:00.

X. PHYSICAL MINERALOGY—A repetition of course IX.

Second semester; 3 credit hours; lectures, T. Th., 9:30; laboratory, T. Th., 1:30-4:00.

XI. ADVANCED MINERALOGY—The determination and study of minerals as to their origin, locality, uses, etc. Must be preceded by course IX or equivalent.

Credit and time to be arranged.

XII. BLOW-PIPE ANALYSIS—Chiefly laboratory work. The determination of many of the principal ore-forming minerals by means of physical properties, blow-pipe and other chemical reactions. Text, Penfield and Brush, Determinative Mineralogy and Blow-Pipe Analysis. Prerequisite: Mineralogy IX.

Second semester; 2 to 4 credit hours; laboratory, T. Th. S., 1:30-4:00.

XIII. ORE MINERALS—A careful study of the metallic minerals used as ores; primarily with reference to their origin, mode of occurrence, properties, both physical and chemical, locality and uses. The ores of gold, silver, copper, lead, zinc, and iron will be studied in this course. Primarily a laboratory course.

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

XVI. ECONOMIC GEOLOGY—Lectures, laboratory work and assigned readings. A general study of the non-metallic and metallic economic geology of the United States, and especially Montana. Such non-metals as coal, oil, gas, gypsum, clay, building stones, etc., and such metals as gold, silver, copper, platinum, zinc, lead, mercury, etc., will be studied. Excursions will be taken to nearby mines and mills. Should be preceded by Geology III and IV. Texts, Ries, Economic Geology of the United States; Rowe, Economic Geology of Montana. Prerequisite: Geology I or Ia.

Second semester; 2 credit hours; T. Th., 9:30; laboratory, M., 1:30-4:30.

XV. ADVANCED ECONOMIC GEOLOGY—This course should follow course XIV, and is a careful study of the coals, oils, gas, etc., of the United States and other countries.

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

XVI. GENESIS OF ORE DEPOSITS—Lectures, assigned readings and mine examinations. The basis of the work will be such books as Van Hise on Metamorphism; Posepny and others on the Genesis of Ore Deposits; Kemp, Ore Deposits of the U. S. and Canada; Phillips and Louis, A Treatise on Ore Deposits; Weed (Beck's), The Nature of Ore Deposits; and many U. S. Geological Reports such as the Butte Special Folio; Geology and Ore Deposits of the Coeur d'Alene District, Idaho; The Leadville District, etc.

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

XVII. SPECIAL ADVANCED ECONOMIC GEOLOGY OR ORE DEPOSITS—Character of work to be arranged upon application.

First semester; credit and time to be arranged.

XX. SPECIAL GEOLOGY OR MINERALOGY—Character of work to be outlined upon application.

Second semester; credit and time to be arranged.

XXII. PETROLOGY—A careful study of rocks as to composition, physical properties, locality, decomposition products, origin and uses. Text, Pirsson's Rocks and Rock Minerals.

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

XXIV. MINING, MINERAL AND GEOLOGICAL LAW—A general study of the legal aspect of mineral deposits, etc. Lectures and recitations. Text, Shamel, with collateral readings.

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

XXVI. PRACTICAL MINERALOGY—A course designed for men intending to do field work in mineralogy, or for prospectors and mining students. Most of the important economic minerals are taken up in this course, and simple field methods of identification studied. Text, Rowe's Practical Mineralogy Simplified.

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

PHYSICS

MAJOR REQUIREMENTS.

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

Candidates for the Teacher's Certificate in this department must have completed acceptably courses I, II, III, and nine additional hours.

COURSES IN PHYSICS.

A. BEGINNING PHYSICS—This course meets the needs of students who have not presented Physics for entrance. The course is continuous with B, and credit will not be given for one without the other. Two recitations, one laboratory.

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

B. BEGINNING PHYSICS—Continuation of A.

Second semester3 3 credit hours; time to be arranged.

I. MECHANICS, MOLECULAR PHYSICS AND HEAT—The course comprises about twenty-five of the fundamental and representative problems which, experimentally, will yield quantitive results. It is required of all students in Engineering. Prerequisite: Courses A and B, or equivalent; Mathematics Ia.

First semester; 4 credit hours; lectures, T. Th., 11:30; laboratory, M. W., 1:30.

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

Second semester; 4 credit hours; lectures, T. Th., 11:30; laboratory, M. W., 1:30.

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

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

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

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

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

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

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

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

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

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

XI. ELECTRICAL MEASUREMENTS—This is a lecture-lab-

oratory course dealing with the theory and practice of electrical measurements and measuring instruments. Prerequisites: Physics I and II.

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

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

XVI. PEDAGOGY OF HIGH SCHOOL PHYSICS—This course will consist of discussions of, and assigned readings and reports on, the subject matter and methods of high school physics. Some attention will be paid to satisfactory methods of demonstrating important phenomena by means of simple apparatus at the disposal of practically any school.

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

XXI or XXII. METEOROLOGY—This course will consist in the study of some good textbook supplemented with laboratory and observation work. The latter will be done, in part, in connection with the U. S. Weather Bureau station, located on the campus.

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

CHEMISTRY

MAJOR REQUIREMENTS.

Students who elect Chemistry as a major subject must complete as a minimum courses in Chemistry amounting to 36 credit hours. These courses should be distributed as follows: General Chemistry, 8 hours; Qualitative Analysis, 4 hours; Quantitative Analysis, 8 hours; Organic Chemistry, 8 hours; Physical Chemistry, 8 hours.

SUPPLEMENTARY COURSES—Students who elect Chemistry as a major subject should take, in addition to the work outlined above, English I and II, Physics I and II, and should acquire a reading knowledge of scientific German and a knowledge of elementary mathematics including the calculus. Courses in French and in Mineralogy and Crystallography are also desirable.

COURSES OF INSTRUCTION.

I and II. GENERAL CHEMISTRY—A study of the fundamental laws of chemistry and of the properties and the relations of the more common elements and their compounds. Text, Al-

exander Smith's Chemistry for Colleges. Lectures, laboratory work and quizzes.

Prerequisite: High school physics.

Both semesters; 4 credit hours.

Note—Chemistry I and II form a continuous course throughout the year. Credit for Chemistry I will not be given until the student has completed Chemistry II.

III or IV. QUALITATIVE ANALYSIS—A study of the methods for the detection and separation of the principal bases and inorganic acids, and of the scientific principles upon which these methods are based. Lectures, laboratory work and quizzes. Prerequisite: Chemistry I and II or their equivalent.

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

V or VI. QUANTITATIVE ANALYSIS—An introduction to quantitative methods and the chemistry upon which they are based. Students perform simple analyses with the use of apparatus ordinarily employed for gravimetric and volumetric analysis. Lecture and laboratory work. Prerequisite: Chemistry I, II and III or IV.

Either semester; 4 credit hours.

VII and VIII. ORGANIC CHEMISTRY—A systematic study of the properties and constitution of the carbon compounds. Lectures and laboratory work. Prerequisite: Chemistry I and II.

Both semesters; 4 credit hours.

Note—Chemistry VII and VIII form a continuous course throughout the year. Credit for Chemistry VII will not be given until Chemistry VIII is completed.

IX and X. PHYSICAL CHEMISTRY—A study of the more important results, methods and problems of theoretical chemistry. Lectures, laboratory work and reports. Chemistry IX and X form a continuous course. Those who elect IX must elect X in the following semester. Prerequisite: Chemistry I, II, III, Physics I and II. An elementary knowledge of calculus is desirable.

Both semesters; 4 credit hours; time to be arranged.

XII. ELECTROCHEMISTRY—Prerequisite: Chemistry IX.

Second semester; credit to be arranged.

XIII or XIV. ADVANCED QUANTITATIVE ANALYSIS—It is the object of this course to increase the student's knowledge of the foundations upon which analytical chemistry rests. The laboratory work is designed to further this aim rather than to give the student a wide experience in analytical technique. Lectures, laboratory work, reading and reports. Prerequisite: Chemistry V or VI.

Either semester; credit to be arranged.

XV. TECHNICAL CHEMISTRY—A course of lectures on the

manufacture and uses of chemical products, and upon the application of chemistry to manufacturing, engineering and the useful arts. Prerequisite: Chemistry I, II, VII and VIII.

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

XVI. TECHNICAL ANALYSIS—The analysis of such bodies as are met with in commercial work. Analysis of minerals, clays, iron and steel, foods, water, fuel, gas, brick, cement, etc. The work may be to some extent adapted to the tastes of the individual student. Chiefly laboratory work. Prerequisite: Chemistry V or VI.

Second semester; credit to be arranged.

XVII. HISTORY OF CHEMICAL THEORIES—This course is designed for students who specialize in chemistry and also for advanced students of other sciences and of philosophy, who desire an acquaintance with present chemical theories, but who have not time to become specialists in chemistry. The course seeks to give a clear insight into the present status and value of chemical theories through an examination of their origin and historical development. Lectures and reports. Prerequisite: An elementary knowledge of inorganic and organic chemistry.

First semester; 3 credit hours.

XVIII. FIRE ASSAYING—Sampling and grinding of ores; fire assay for silver, gold, lead and copper. Chiefly laboratory work. Prerequisite: Chemistry I and II.

Second semester; 2 credit hours.

XX. WET ASSAYING—Rapid processes, chiefly volumetric, for the analysis of minerals and ores. Chiefly laboratory work. Prerequisite: Chemistry V or VI.

Second semester; credit to be arranged.

XXI. METALLURGY OF IRON, STEEL AND LEAD—Lectures and reports.

First semester; 3 credit hours. Given in alternate years. Omitted in 1913-14.

XXII. METALLURGY OF COPPER—Lectures, reports and excursions.

Second semester; 3 credit hours. Given in alternate years. Omitted in 1913-14.

ADVANCED COURSES IN CHEMISTRY AND COURSES OF RESEARCH—The department of chemistry is prepared to arrange more advanced courses in Inorganic, Analytical, Organic and Physical Chemistry for students who are properly prepared. Courses of Research in Analytical and Physical Chemistry will be arranged for students who have the requisite training and experience.

COURSE IN ENGINEERING CHEMISTRY.

A course in Engineering Chemistry, first established in 1909, is adapted to the needs of students who expect to devote their time to the application of chemistry to the arts. Students graduating from this course find employment as analysts, electrochemists, managers or superintendents having to deal with problems of construction or management of smelters, sugar refineries, gas plants, fertilizer works, and various other branches of industry where special preparation is necessary. For detailed information regarding the subjects in the course, descriptions in the various departments should be consulted. Where possible two or more years of high school German should be presented for entrance. In this case electives may be submitted for part of the German prescribed below.

FIRST YEAR.

First Semester.	No. of Course	Credits	Second Semester.	No. of Course	Credits
Mathematics	I	5	Mathematics	II	5
Chemistry	I	4	Chemistry	II	4
Drawing	M10	2	Drawing	M11	2
English	I	3	English	II	3
Physical Culture	I	½	Physical Culture	II	½

SECOND YEAR.

First Semester.			Second Semester.		
Mathematics	III	5	Mathematics	IV	3
Chemistry	III	4	Chemistry	IV	4
Physics	I	4	Physics	II	4
German	III	3	German	IV	3
Heat Power Engineering	M30	3	Chemistry	XVIII	2
Physical Culture	III	½	Elective		2
			Physical Culture	IV	½

THIRD YEAR.

First Semester.			Second Semester.		
Chemistry	VII	4	Chemistry	VIII	4
Chemistry	IX	4	Chemistry	X	4
Physics	XI	3	Direct Currents	E4	3
Mathematics	V	3	Mathematics	VI	3
Kinematics	M16	2	Elective		4
Elective		2			

FOURTH YEAR.

First Semester.			Second Semester.		
Alternating Currents	E10	3	Heat Power Engineering	M31	3
Applied Mechanics	C22	3	Hydraulics	M50	3
Machine Design	M17	2	Chemistry	XVI	4
Chemistry	XV	5	Thesis (Chemistry)		5
Thesis (Chemistry)		5	Elective		3

SCHOOL OF ENGINEERING

FACULTY.

EDWIN BOONE CRAIGHEAD, M. A. LL. D., D. C. L.
President of the University.

ARTHUR W. RICHTER, M. M. E.
Dean and Professor of Engineering.

FREDERICK S. SCHEUCH, M. E., A. C.
Professor of Modern Languages.

JESSE P. ROWE, Ph. D.
Professor of Geology.

MORTON J. ELROD, Ph. D.
Professor of Biology.

WILLIAM R. PLEW, M. S.
Assistant Professor of Civil Engineering.

LOUIS C. PLANT, M. S.
Professor of Mathematics.

PHILIP S. BIEGLER, B. S., E. E.
Assistant Professor of Electrical Engineering.

RICHARD H. JESSE, Jr., Ph. D.
Professor of Chemistry.

GEORGE F. REYNOLDS, Ph. D.
Professor of English and Rhetoric.

GEORGE H. CUNNINGHAM, B. S., M. E.
Assistant Professor of Mechanical Engineering

JOSEPH H. UNDERWOOD, Ph. D., LL. D.
Professor of History and Economics.

ROBERT N. THOMPSON, B. S.
Assistant Professor of Physics.

EUGENE F. A. CAREY, B. S.
Instructor in Mathematics.

GUSTAVE A. GROSS.
Instructor in Engineering Shop Practice.

WILLIAM W. H. MUSTAINE, B. S.
Director of Physical Education.

GENERAL PLAN AND SCOPE OF THE SCHOOL

The rapid industrial development of the West makes the profession of Engineering one of 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 a four years' course 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 laboratories, drawing rooms, field exercises and shops.

The degree of Bachelor of Science in Engineering is conferred upon students successfully completing the regular four years' course in any one of the main fields of engineering.

Specialization in Civil, Mechanical, or Electrical Engineering, may be pursued in the student's third and fourth years. the subjects in the first two years of work being almost identical.

ROOMS AND EQUIPMENT.

The School of Engineering 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 steam laboratory, gas engine laboratory, fuel laboratory, electrical laboratory, materials testing laboratory, hydraulic laboratory, wood shop, machine shop, forge room and foundry. The boiler room is located in the basement.

DRAWING ROOMS—The drawing rooms are suitably equipped with drawing tables and drawing boards. A collection of standard works, proceedings of various American institutes and current periodicals is provided.

SURVEYING EQUIPMENT—For field work in surveying there is an adequate supply of transits, levels, plane tables, aneroids, solar attachments, rods, chains, etc.

STEAM LABORATORY—In the boiler room there are three 70-horsepower multitubular boilers, which furnish steam for heating and power and are available for tests. There is also a steam pump and the power equipment of the University Paul-system steam-heating plant, which apparatus is also available for testing purposes.

In the steam laboratory there is also a Corliss engine direct connected to a Wolfe ammonia compressor, also condensers, brine

cooler, pumps, etc., forming a complete ammonia refrigerating system used only for testing purposes. The engine is available for instruction in setting of Corliss valves and for efficiency tests, etc. This laboratory is also well equipped with indicators, calorimeters and other small appliances for making complete tests of this type of machines.

HYDRAULIC LABORATORY—In the hydraulic laboratory tests of discharge through orifices and over weirs, of friction losses in pipes, bends, valves, etc., may be made. The calibration and test of such apparatus as gauges, Venturi meters, hydraulic rams, water meters, may also be carried out.

FUEL LABORATORY—The fuel laboratory is equipped with the various instruments required for determining the heating value, physical properties and constituents of the various fuels, including coals, oils, illuminating gases, producer gases and other engine fuels. Parr Calorimeters and the Junker calorimeter are used for heating value determinations. There are also Hempel, Orsat and other gas analysis apparatus. Determination of the constituents of the products of combustion are also made.

CEMENT TESTING LABORATORY—The cement testing laboratory contains a Fairbanks-Morse cement testing machine, vicat and specific gravity apparatus, moist closet and immersion tank, together with the necessary moulds, trowels, sieves, etc., for making, tension, time of setting, fineness, and other physical tests of cement.

ELECTRICAL LABORATORY—The equipment of the electrical laboratory includes one 15 K.W., 110 volt, direct current Watson generator, one 10 K.W., 220 volt, direct current Western Electric generator, and a 10 K.W., 3 phase, 60 cycle, 110 volt, Crocker-Wheeler alternator with .8 K.W. belted exciter. These generators supply whatever current may be needed in the laboratory. For either motor or generator tests there are also a 15 H. P., 220 volt direct current motor, a 6 H. P., 250 volt Allis-Chalmers series motor, a 2 K.W., 6 ring Westinghouse synchronous converter, all equipped with starting devices for motor operation. A 5 H. P., 3 phase General Electric induction motor, equipped with auto starter, and three transformers arranged with taps for phase, as well as voltage transformation complete the list of heavy machinery. Two small machines, a commutating pole motor and a two-phase induction motor, are used chiefly for lecture room demonstration. There is also a good supply of rheostats, brakes, inductances, etc., in addition to stock for instruction in interior wiring.

PHOTOMETRY LABORATORY—There has also been installed a complete Reichanstalt bar photometer, including necessary appliances, for work in illuminating engineering.

WOOD SHOP—The wood shop is 30x40 feet in size, and is lighted from opposite sides. There are places for bench work, furnished with benches, vices, and tool-cupboards stocked with the necessary tools. Ten lathes of 11-inch swing enable an equal number of students to engage in wood turning. There is also a large wood-turning lathe of 16-inch swing and 12-foot bed, with double-ended spindle, for large work. A double circular sawing table, with cross-cutting and rip-saws, a jig saw, a wood-trimmer, and a grindstone, etc., comprise the equipment of the shop.

MACHINE 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 Brown and Sharp Universal Milling Machine, a shaper, 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 drill press, a small drill press, emery grinders, a Well's cutter and reamer grinder, and benches with vises 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.

FORGE SHOP—Adjacent to the machine shop is the forge shop, 30x30 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.

FOUNDRY—The foundry is 30x30 feet in size and well lighted by windows on two sides of the room. Its euipment consists of a No. 0 Whiting Cupola, a Sturtevant pressure blower, a core oven and tools and apparatus necessary for foundry work.

DEPARTMENT OF CIVIL ENGINEERING

It is the aim in the Department of Civil Engineering to prepare students in such a way that they may have the proper understanding of, and be familiar with the work they will be called upon to do as Civil Engineers.

Special attention is given to draughting and surveying, since nearly all students begin their subsequent professional career in this way. In common with the students in the other departments of engineering, mechanical drawing is practiced for six hours each week during the freshman year. This work is followed by more advanced courses in drawing during the sophomore year. In the junior and senior years the courses in drawing and design are supplemental to other courses.

At the beginning of the second semester of the freshman year those electing the Civil Engineering course begin the study of surveying; the classroom instruction lasts until spring, when the entire time alotted to the subject is spent in the field. In the fall the students make a topographical survey of some accessible tract; whenever possible the time is so arranged that one full day per week may be given to the subject. The notes taken during this survey are used during the winter for office practice in mapping.

Immediately following the commencement exercises in June, two weeks are spent in camp, making a complete preliminary survey of a few miles of railroad, the notes being used by the junior class in railroad engineering, from which notes the students prepare a complete design and estimate. The biological station, a property of the University situated at Yellow Bay on the beautiful Flathead Lake, was located so that it would be adapted to the needs of surveying students in the summer camp.

During the junior year the subject of structural engineering is begun and continued throughout the senior year, the student analyzing the stresses and design of existing structures. In the senior year the students make complete detailed designs for a truss and plate girder bridge.

In the senior year sanitary engineering and similar subjects are also studied.

COURSES IN CIVIL ENGINEERING.

FRESHMAN YEAR.

First Semester.	No. of Course	Credits	Second Semester.	No. of Course	Credits
Mathematics	I	5	Mathematics	I	5
Chemistry	I	4	Chemistry	I	4
Shop	MI	2	Surveying	CI	2
Drawing	M10	2	Drawing	M11	2
English	I	3	English	II	2
German	Ia	3	German	IIa	3
Physcial Culture	I	½	Physical Culutre	II	½

SOPHOMORE YEAR.

First Semester.			Second Semester.		
Mathematics	III	5	Mathematics	IV	3
Physics	I	4	Physics	II	4
Surveying	C2	2	Surveying	C3	2
Drawing	M12	2	Surveying Camp	C4	0
Descriptive Geometry	M14	2	Geology	Ia	2
English Composition		1	Mechanics	C20	3
German	IIIa	2	English Composition		1
Physical Culture	III	½	German	IVa	2
			Physical Culture	III	½

JUNIOR YEAR.

First Semester.			Second Semester.		
Surveying	C5	2	Applied Mechanics	C23	3
Mechanics	C21	3	R. R. Engineering	C31	3
Applied Mechanics	C22	3	Bridge Analysis	C41	2
R. R. Engineering	C30	3	Heat & Power Eng.	M30	1
Graphics	C40	2	Hydraulics	M50	3
Geology	II	2	Hydraulic Lab.	M52	1
Electrical Eng.	E2	3	Electrical Lab.	E5	1
			Elective		2

SENIOR YEAR.

First Semester.			Second Semester.		
Materials of Const.	C24	3	Materials Lab.	C26	2
Materials Lab.	C25	2	Structural Eng.	C44	4
Structural Eng.	C42	4	Arches	C45	1
Masonry Const.	C43	2	Sewerage	C51	2
Roads and Pavements	C50	2	Water Supply	C52	2
Hydraulic Eng.	M51	3	Mechanical Lab.	M40	1
Elective		2	Contracts & Spec.	M61	1
			Thesis or Elective		5

SURVEYING.

C1. SURVEYING—The use and adjustment of the transit and the level; taping; differential and profile leveling; surveying with transit and tape; latitude and departures; public land surveys; the use of the slide rule and planimeter.

Freshmen; second semester; 2 credit hours.

C2. SURVEYING—Continuation of course C1. The use of the plane table and the solar attachment; use of the stadia; topographic surveying and map making; city surveying, lot surveys, subdivisions.

Sophomores; first semester; 2 credit hours.

C3. RAILROAD SURVEYING—The theory and practice of railroad surveying; computation and field location of simple, compound and transition curves; note keeping; solution of various problems involving the mathematics of location.

Sophomores; second semester; 2 credit hours.

C4. SURVEYING CAMP—Two weeks in June, immediately following the work at the University, are spent in camp, making a preliminary survey for a few miles of railroad. The camp routine is that of any well organized camp.

Sophomores; second semester; required without credit.

C5. HIGHER SURVEYING—Astronomy for engineers, determination of meridian, latitude, longitude, time; theory of triangulation; precise leveling; topographic details.

Juniors; first semester; 2 credit hours.

C6. SURVEYING—A complete short course in surveying for Mechanical and Electrical engineering students, consisting of text and field practice in transit surveying, leveling, etc.

Juniors; first semester; 2 credit hours.

MECHANICS AND STRENGTH OF MATERIALS.

C20. MECHANICS—The same as Mathematics VI, which see.

Sophomores; second semester; 3 credit hours.

C21. MECHANICS—The same as Mathematics V, which see.

Juniors; first semester; 3 credit hours.

C22. APPLIED MECHANICS—The elastic properties of materials; stress and deformation; the theory of stresses in beams; the flexure of beams; torsion; the stresses in cylinders; the theory of columns. Prerequisite: C20.

Juniors; first semester; 3 credit hours.

C23. APPLIED MECHANICS—The continuation of C22. The stresses in hooks, flat plates, springs, flitched beams, earth pressure, etc.

Juniors; second semester; 3 credit hours.

C24. MATERIALS OF CONSTRUCTION—Lectures and reading on the manufacture and physical properties of cast iron,

wrought iron, steel, cement, concrete, timber and other materials used in engineering construction. Prerequisite C20.
Seniors; first semester; 3 credit hours.

C25. MATERIALS LABORATORY—Laboratory exercise in testing materials; cement, wood, concrete, steel and iron.
Seniors; first semester; 2 credit hours.

C26. MATERIALS LABORATORY—A continuation of C25, extending the tests to include the strength of structural details.
Seniors; second semester; 2 credit hours.

RAILROAD ENGINEERING.

C30. RAILROAD ENGINEERING—The notes taken in the summer camp are mapped, and from them a location and estimate made. The laboratory time is supplemented with a study of the economics of railroad location.
Juniors; first semester; 3 credit hours.

C31. RAILROAD ENGINEERING—A study of the efficiency of different systems of organization in maintenance of way department; track; buildings; yards; standards.
Juniors; second semester; 3 credit hours.

STRUCTURAL ENGINEERING.

C40. GRAPHICS—The graphical determination of the stresses in roof trusses and other simple structures. The design of a roof truss in wood and steel.
Juniors; first semester; 2 credit hours.

C41. BRIDGE ANALYSIS—The analysis of the stresses in bridges, due to various forms of loading; the action of counters; portal bracing; combination of stresses; impact.

C42. STRUCTURAL ENGINEERING—Each student makes a complete design and detailed drawing of a plate girder railroad bridge and of a pin connected Pratt truss highway bridge.
Seniors; first semester; 4 credit hours.

C43. MASONRY CONSTRUCTION—Methods of design and construction of piers, abutments, retaining walls, and foundations; study of the materials of masonry; concrete construction; stereotomy.
Seniors; first semester; 2 credit hours.

C44. STRUCTURAL ENGINEERING—A study of various types of bridges and roof trusses, the determination of stresses by the consideration of the elastic deformation; details in building construction; shop methods.
Seniors; second semester; 4 credit hours.

C45. ARCHES—The theory of the elastic arch, and the design of a hingeless concrete arch rib.

MUNICIPAL AND SANITARY ENGINEERING.

C50. ROADS AND PAVEMENTS—The location, construction, and maintenance of earth, gravel and broken stone roads. A comparison of the various pavements, adaptability to certain locations, cost, and method of construction. Patent pavements.
Seniors; first semester; 2 credit hours.

C51. SEWERAGE—Current practice in the design of sewer systems. The problem of sewerage disposal; current literature.

C52. WATER SUPPLY—The question of furnishing an adequate supply of potable water to a populus community, is studied from both the sanitary, and mechanical side.
Seniors; second semester; 2 credit hours.

DEPARTMENT OF MECHANICAL ENGINEERING

The chief purpose of the instruction in the Department of Mechanical Engineering is to enable the student to deal intelligently with general engineering problems.

The aim is to give a firm foundation in the fundamental principles and to keep the course of as broad a nature as is possible, so that graduates may be prepared to enter any field of Mechanical Engineering.

It is also the aim of this department to give such practical training and such instruction in the economics of engineering as is possible in a technical school. It is a well-known and well-recognized fact that theoretical knowledge must be supplemented by experience in practice and by contact with life before one can attain his greatest usefulness in his profession; hence an effort is made to bring the student in touch with commercial engineering practice, in order that he may become familiar with problems encountered in modern engineering and with commercial methods of solving them. Students while taking their University course are urged to spend a part of their summer vacation working in machine shops or some industrial plant. During the senior year students make excursion trips to manufacturing and power plants.

COURSE IN MECHANICAL ENGINEERING.

FRESHMAN YEAR.

First Semester	No. of Course	Credits
Mathematics	I	5
Chemistry	I	4
Shop	M1	2
Drawing	M10	2
English	I	3
German	Ia	3
Physical Culture	I	½

Second Semester.	No. of Course	Credits
Mathematics	II	5
Chemistry	I	4
Shop	M2	2
Drawing	M11	2
English	II	3
German	IIa	3
Physical Culture	II	½

SOPHOMORE YEAR.

First Semester.		
Mathematics	III	5
Physics	I	4
Machine Shop	M4	2
Machine Drawing	M12	2
Descriptive Geometry	M14	2
English Composition		1
German	IIIa	2
Physical Culture	III	½

Second Semester.		
Mathematics	IV	3
Physics	II	4
Mechanics	C20	3
Machine Shop	M6	2
Kinematics	M16	3
English Composition		1
German	IVa	2
Physical Culture	IV	½

JUNIOR YEAR.

First Semester		
Surveying	C6	2
Mechanics	C21	3
Applied Mechanics	C22	3
Machine Design	M17	2
Heat Power Eng.	M30	3
Electrical Meas.	E1	2
Direct Currents	E3	3

Second Semester.		
Applied Mechanics	C23	3
Heat Power Eng.	M31	3
Mechanical Lab.	M40	1
Technical Fuel Anal.	M43	1
Hydraulics	M50	3
Hydraulics Lab.	M52	1
Direct Currents	E4	3
Electrical Lab.	E5	1
Economics		2

SENIOR YEAR.

First Semester		
Power Plants	M32	3
Heating, Ventilating	M35	2
Mechanical Lab.	M41	2
Hydraulic Eng.	M51	3
Alternating Currents	E10	3
Electrical Lab.	E12	2
Elective		1

Second Semester.		
Designing, Drawing	M19	1
Power Plants	M33	2
Steam Turbines	M34	2
Mechanical Lab.	M42	2
Principles of Mfg.	M60	2
Contracts & Specif.	M61	1
Electrical Lab.	E13	2
Power Generation Transmission	E16	2
Elective or Thesis		4

SHOP WORK.

M1. WOOD WORK—This includes carpentry, wood turning and pattern making; beginning with exercises on the wood bench and lathe, leading up to the construction of patterns and core boxes which the student will use in the foundry.

Freshmen; first semester; 6 hours per week, laboratory and lecture; 2 credit hours.

M2. FORGE AND FOUNDRY WORK—The forge practice consists of drawing, upsetting and bending. The foundry practice consists of green sand molding for iron castings, core making, cupola practice, mixing cast iron, making castings for machine shop use. One-half of the semester is spent in forge and one-half in the foundry.

M. E. Freshmen; second semester; 6 hours per week, laboratory and lecture; 2 credit hours.

M3. ELECTRICAL CONSTRUCTION—Special work in shop practice for electrical engineering students.

E. E. Freshmen; second semester; 6 hours per week, laboratory and lectures; 2 credit hours.

M4. MACHINE SHOP—Bench work, chipping, filing and fitting. Exercises on drill-press lathe, shaper, grinder and milling machine, including gear cutting.

M. E. Sophomores; first semester; 6 hours per week, laboratory and lectures; 2 credit hours.

M5. ELECTRICAL CONSTRUCTION—Special work in winding, etc., for electrical students.

E. E. Sophomores; first semester; 6 hours per week; 2 credit hours.

M6. MACHINE SHOP—The construction of some machine or machine parts, including machining and fitting.

M. E. Sophomores; second semester; 6 hours per week; 2 credit hours.

M7. ELECTRICAL CONSTRUCTION—Continuation of M5.

E. E. Sophomores; second semester; 6 hours per week; 2 credit hours.

MECHANICAL DRAWING AND DESIGN.

M10. ENGINEERING DRAWING—Freehand lettering, geometrical problems, construction of various curves. Orthographic projection.

Freshmen; first semester; 6 hours per week, laboratory and lectures; 2 credit hours.

M11. ENGINEERING DRAWING—Development of surfaces, isometric projection, making working drawings, including conventions and standards, etc., following the best practice in commercial drafting rooms. Prerequisite: M10.

Freshmen; second semester; 6 hours per week, laboratory and lectures; 2 credit hours.

M12. MACHINE DRAWING--Advanced machine drawing, sketching machine parts, making detail and assembly drawings. Structural detailing, tracing and blue printing. Prerequisite: M11.

Sophomores; first semester; 6 hours per week, laboratory and lectures; 2 credit hours.

M14. DESCRIPTIVE GEOMETRY—Lectures, recitations and drawing, dealing with lines, planes, solids, tangents and intersections. Prerequisite: M11.

Sophomores; first semester; 2 credit hours.

M16. KINEMATICS—Involving theory of mechanism, instant centers, pulleys, cam gears, linkages, velocity and acceleration diagrams. Prerequisite: M12.

Sophomores; second semester; 6 hours per week, lectures, recitations and drawing; 2 credit hours.

M17. MACHINE DESIGN—The student is to undertake the complete design of a machine or of machine parts, making theoretical calculations and modifying them by practical considerations. Assembly drawing is made and several sheets of details. Prerequisite: M16.

Juniors; first semester; 6 hours per week; lectures and laboratory; 2 credit hours.

M18. DESIGNING AND DRAWING—Graphical statics of roofs and various other structures, discussion of problems met with in the design, construction and equipment of power plants, mills, factories, etc. Prerequisite: M17.

Seniors; first semester; 6 hours per week; lectures and laboratory; 2 credit hours.

M19. DESIGNING AND DRAWING—A continuation of course M18. This work is carried on in connection with course M33.

HEAT POWER ENGINEERING.

M30. HEAT POWER ENGINEERING—Principles of the mechanical theory of heat and their application to the various forms of steam engines, turbines, internal combustion engines, refrigerating machines and air compressors. Prerequisite: Physics II and Chemistry II.

Juniors; first semester; 3 credit hours.

M31. HEAT POWER ENGINEERING—Continuation of M30, treating of boilers, furnaces, combustion, fuels, engines and valve gears.

Juniors; second semester; 3 credit hours.

M32. POWER PLANTS—A study of construction, operation, maintenance, and economy of power plants.
Seniors; first semester; 3 credit hours.

M33. POWER PLANTS—Design of power stations for the production of mechanical or electrical energy. Each student makes at least one complete design of a power station. Consideration of local conditions, construction cost and cost of operation.
Seniors; second semester; 2 credit hours.

M35. STEAM TURBINES—Theory and construction of the principal types of steam turbines and their application. Prerequisite: M30.

M35. HEATING AND VENTILATING—Principles underlying the design and construction of heating systems; steam, hot water, and hot air heating systems.
Seniors; first semester; 2 credit hours.

M36. COMPRESSED AIR—A study of the theory and construction of air compressors and compressed air machinery; uses of compressed air. Prerequisite: M30.
Seniors; second semester; 2 credit hours.

M37. GAS ENGINES—Theory and construction of gas, gasoline and producer gas engines; Diesel motor and other oil engins. Prerequisite: M30.
Seniors; first semester; 2 credit hours.

M40. MECHANICAL LABORATORY—Calibration of instruments; efficiency of simple machines; oil testing and transmission of power. Lectures and laboratory.
Juniors; second semester; 1 credit hour.

M41. MECHANICAL LABORATORY—Determination of the efficiencies of the steam boiler, steam, gas and gasoline engines; setting of various types of engine valve gears. Lectures and laboratory.
Seniors; first semester; 2 credit hours.

M42. MECHANICAL LABORATORY—Determination of power plant losses and efficiencies; operation and construction of refrigerating plants. Lectures and laboratory.
Seniors; second semester; 2 credit hours.

M43. TECHNICAL FUEL, GAS AND OIL ANALYSIS—Lectures and laboratory instruction in the technical analysis of coals, illuminating and fuel gases and the products of combustion; the use of oils and oil analyses.
Juniors; first semester; 1 credit hour.

HYDRAULIC ENGINEERING.

M50. HYDRAULICS—Hydrostatics, hydrodynamics, flow of

water through orifices, over weirs, through pipes, conduits, open channels, etc. Prerequisite: C21.

Juniors; second semester; 3 credit hours.

M51. HYDRAULIC ENGINEERING—Determination of run-off, flow in streams, study of the various forms of water wheels and pumps; the turbine as applied to power stations, etc.

Seniors; first semester; 3 credit hours.

M52. HYDRAULIC LABORATORY—Calibration of instruments, tests of flow through orifices over weirs, etc.

Juniors; second semester; 1 credit hour.

COMMERCIAL ENGINEERING.

M60. PRINCIPLES OF MANUFACTURING—Lectures on shop standards, processes, tools and equipment; scientific methods of cost and timekeeping; general management and operation of factories.

Seniors; second semester; 2 credit hours.

M61. CONTRACTS AND SPECIFICATIONS—A study of the laws of contracts pertaining to engineering work, and the preparation of engineering specifications.

Seniors; second semester; 1 credit hour.

SEMINARY AND THESIS.

M70. 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.

Seniors; second semester; 1 credit hour.

M71. THESIS—The preparation by the student of a thesis consisting of an original investigation or design in some field of engineering.

Seniors; second semester; 3 credit hours.

DEPARTMENT OF ELECTRICAL ENGINEERING

This is the day of the highly trained specialist in practically all lines of professional work. The "electrician" in the trade, unless he be a genius, has small chance to compete with the technically trained man in the field of electrical engineering.

It should be clearly understood that the University aims to produce professional men and not artisans. And, although an engineer commonly has charge of important electrical construction work, his most useful field of activity, and that for which he is especially trained, is in handling problems requiring judgment and foresight, experimentation, the design of machinery and apparatus, and in the arrangement of this apparatus for its successful and efficient utilization. The constantly increasing applications of electricity call for men of this type and training.

Although the first two years of the course are devoted to the fundamental sciences, mathematics, drawing, shop work, etc., the student is encouraged to cultivate a taste for the current technical literature. Beginning with the second semester of the freshman year, the shop courses are designed to familiarize the student with the construction of electrical apparatus and also with the elementary calculations involved. In the junior year the study of electrical engineering proper is begun, and in the senior year advanced and specialized work is offered in illumination, hydraulic generation and transmission, telephony and electric railway engineering.

COURSE IN ELECTRICAL ENGINEERING.

FRESHMAN YEAR.

First Semester.	No. of Course	Credits	Second Semester.	No. of Course	Credits
Mathematics	I	5	Mathematics	II	5
Chemistry	I	4	Chemistry	I	4
Shop	M1	2	Electrical Const.	M3	2
Drawing	M10	2	Drawing	M11	2
German	Ia	3	German	IIa	3
English	I	3	English	II	3
Physical Culture	I	½	Physical Culture	II	½

SOPHOMORE YEAR.

First Semester.			Second Semester.		
Mathematics	III	5	Mathematics	IV	3
Physics	I	4	Physics	II	4
Electrical Const.	M5	2	Mechanics	C20	3
Drawing	M12	2	Electrical Const.	M7	2
Descriptive Geometry	M14	2	Kinematics	M16	3
German	IIIa	2	German	IVa	2
English Composition		1	English Composition		1
Physical Culture	III	½	Physical Culture	III	½

JUNIOR YEAR.

First Semester.			Second Semester.		
Surveying	C6	2	Applied Mechanics	C23	3
Mechanics	C21	3	Heat Power Eng.	M31	3
Applied Mechanics	C22	3	Mechanical Lab.	M40	1
Machine Design	M17	2	Fuel Analysis	M43	1
Heat Power Eng.	M30	3	Hydraulics	M50	3
Electrical Meas.	E1	2	Direct Currents	E4	3
Direct Currents	E3	3	Electrical Lab.	E5	1
			Elective		3

SENIOR YEAR.

First Semester.			Second Semester.		
Power Plants	M32	3	Power Plants	M33	2
Mechanical Lab.	M41	2	Mechanical Lab.	M42	2
Hydro Engineering	M51	3	Contracts & Specif.	M61	1
Alternating Currents	E10	3	Alternating Currents	E11	3
Electrical Lab.	E12	2	Electrical Lab.	E13	2
Illumination	E14	2	Telephones	E15	2
Elective		3	or Elec. Railways	E17	2
			Power Gen. Trans.	E16	2
			Thesis or Elective		4

E1. ELECTRICAL MEASUREMENTS—An introduction to laboratory and commercial methods of testing electrical apparatus, including the study of instruments, calibration and manipulation. Prerequisite: Physics II and Mathematics IV.

Juniors; first semester; 2 credit hours.

E2. ELECTRICAL ENGINEERING—A brief study of the principles of electrical machinery and systems for civil engineers. Prerequisite: Physics II and Mathematics IV.

Juniors; first semester; 3 credit hours.

E3. DIRECT CURRENTS—A study of the fundamental principles of direct current generators and motors, the analysis of preformance curves, and the selection of electrical apparatus. Prerequisite: Physics I and Mathematics IV.

Juniors; first semester; 3 credit hours.

E4. DIRECT CURRENTS—A continuation of course E3, covering practical operation, principles of design, commutation, etc. Prerequisite: E3.

Juniors; second semester; 3 credit hours.

E5. ELECTRICAL LABORATORY—Characteristic curves of direct current machinery. Accompanies E3. Prerequisite: E3.

Juniors; second semester; 1 credit hour.

E5. ELECTRICAL LABORATORY—Characteristic curves of direct current machinery. Accompanies E4. Prequisite: E3.

Juniors; second semester; 1 credit hour.

E10. ALTERNATING CURRENTS—Solution of circuits containing resistance, inductance and capacity; single phase and polyphase systems; study of the alternator, synchronous motor and rotary converter. Prerequisite E4.

Seniors; first semester; 3 credit hours.

E11. ALTERNATING CURRENTS—Continuation of E10, including study of the transformer, induction motor and single phase motors. Prerequisite: E10.

Seniors; second semester; 3 credit hours.

E12. ELECTRICAL LABORATORY—Laboratory work to supplement course E10. Prerequisite: E4 and E5.

Seniors; first semester; 2 credit hours.

E13. ELECTRICAL LABORATORY—A continuation of E12. Accompanies E11. Prerequisite: E10 and E12.

Seniors; second semester; 2 credit hours.

E14. ILLUMINATION AND PHOTOMETRY—The study of light, incandescent and arc lighting, with photometric tests for candle power, light distribution and efficiency. Prerequisite: E1 and E3.

Seniors; first semester; 2 credit hours.

E15. TELEPHONE ENGINEERING—A study of the com-

mon types of telephone apparatus and systems, with laboratory practice in telephone installation, testing, location of faults, etc. Prerequisite: E10.

Seniors; second semester; 2 credit hours.

E16. POWER GENERATION AND TRANSMISSION—The selection of apparatus for the electrical end of power plants; high tension transmission line calculation and design; the study of distribution systems and methods of charging for electrical energy. Prerequisite: E10.

Seniors; second semester; 2 credit hours.

E17. ELECTRIC RAILWAY ENGINEERING—Principles that underlie the design, construction and operation of electric railway systems, including the electrification of steam roads. Open to seniors in Electrical Engineering. Prerequisite: E10.

Second semester; 2 credit hours.

ENGINEERING EXTENSION WORK.

The University Engineering Extension Work has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend the university. The courses, arranged so as to aid those engaged in practical work, consist of lectures, discussions, recitations, drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes, once a week to lecture or to conduct class recitations. In this way the student comes in direct contact with the instructor. Classes have been formed in several of the larger cities of Montana and the work will be extended to other points. For information, inquirers should address the Dean, School of Engineering, University of Montana. Among the courses offered are the following:

1. SHOP CALCULATIONS—Calculations of shop problems; size of gear, pulleys, etc.

2. DRAWING, COURSE 1—Instruction in the use of instruments, lettering and projections.

3. DRAWING, COURSE 2—Development of surfaces and the drawing of simple machine parts.

4. DRAWING COURSE 3—Machine details, shop drawings, assembly drawings of machines.

5. DRAWING, COURSE 4—Design of simple machines.

6. DESIGN OF SIMPLE STRUCTURES—Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

7. VALVE GEARS—A study of valve movements as applied to locomotive and other engines. The Zeuner diagram.

8. ELECTRICAL MACHINERY—Direct currents, a study of the construction and operation of direct current machinery.

9. ELECTRICAL MACHINERY—Alternating currents, a study of the construction and operation of alternating current machinery.

10. HEAT AND STEAM—Nature of heat, use of steam table, efficiency of the perfect engine, compounding, jacketing, superheating.

11. INTERNAL COMBUSTION ENGINES—Gas, gasoline and producer gas engines, gas producers.

DEPARTMENT OF LAW

FACULTY OF THE LAW SCHOOL.

EDWIN BOONE CRAIGHEAD, M. A., LL.D., D. C. L.
President of the University.

HENRY WINTHROP BALLANTINE, A. B., LL.B., (Harvard)
Dean and "W. W. Dixon" Professor of Law.

ALBERT NEWLON WHITLOCK, A. M., LL.B., (Harvard)
Professor of Law.

CHARLES MELVIN NEFF, Ph.B., LL.B., (Columbia)
Professor of Law.

———— Professor of Law (To Be Appointed).

JOHN B. CLAYBERG, LL.B. (Michigan)
Non-Resident Lecturer on Mining and Irrigation Law, and Consulting Dean.

HON. F. C. WEBSTER, (ex-Judge District Court)
Lecturer on Probate Law and Procedure.

GEORGE MERIT PALMER, A. M.
Instructor in Debate and Argument.

MONTANA LAW SCHOOL.

The Law School was established as a department of the University of Montana at Missoula in 1911. Up to that time there had been no Law School in Montana.

The department offers a standard law course, covering three academic years, and gives special attention to practice court work, procedure, mining and irrigation law, and preparation for the practice of law in Montana and the Western States generally. Owing to a generously increased appropriation by the recent legislature, the law school will be enabled to add to its teaching

staff a new professor and a new instructor in law, and will also be able to add substantially to its present library facilities. The faculty is composed of carefully selected teachers, trained in the best law schools, who have had wide experience in actual practice and who, with one or two exceptions, devote their entire time to instruction.

ENLARGED QUARTERS.

The law school is now taking up more commodious quarters in the Library Building, where rooms for the law library, the offices of the faculty and the classes of the department will occupy an entire floor.

DONATIONS TO THE LAW LIBRARY.

The law school is fortunate in having a good working library, composed in part of the private law library of the late Judge W. W. Dixon, in part of the library of the late Colonel T. C. Marshall, and other books purchased with funds generously donated by Mrs. Dixon and with state funds. The library thus established is known as the W. W. Dixon Memorial Library in memory of Judge Dixon, and a professorship has been named after him. The library of over four thousand volumes is constantly being enlarged and brought down to date. It embraces several sets of state reports, the reports of all the federal courts, the American Digest and National Reporter system, as well as the leading text books, encyclopedias, collections of statutes, legal periodicals, and sets of selected cases, such as the American Decisions, American Reports, American State Reports, Lawyers' Reports Annotated (old and new series), the American and French Annotated Cases; also the decisions of the Interior Department on Public Lands. Consulting Dean Clayberg has presented a set of over two hundred volumes of English common law and chancery reports.

REQUIREMENTS FOR ADMISSION TO REGULAR AND SPECIAL STANDING.

Students may register in the Department of Law either in regular or in special standing. It is expected that all students will enter at the opening of the college year, September 9. Students may by special permission enter at the beginning of the second semester. Regular students, who are candidates for the degree of Bachelor of Laws (LL.B) must present credentials showing that they have completed substantially one-half (62 credit hours) or more of the work required for the degree of B. A. or B. S. in the University of Montana, or two years' work in some other college or university.

Special students may be admitted to all the privileges and courses of the Law School the same as regular students, pro-

vided they are twenty-one years of age or over, and have diplomas from accredited high schools, or have evidence of an education equivalent to a four-year high school course. In exceptional cases of distinguished excellence in the three years of law work, special students may be granted a law degree, but in all ordinary cases will be given a certificate as to the work done, in lieu of the degree awarded to regular students.

Advanced standing in Law may be granted to students who present satisfactory credentials for equivalent courses taken in standard law schools. Also, in special cases, advanced standing may be granted upon examination satisfactory to the Faculty.

GRADUATION AND DEGREES.

Regular students who have satisfactorily completed courses in law, equivalent to three full years of professional study of the law, will be granted the degree of Bachelor of Laws. (LL.B.)

The proper preparation and trial of at least five cases in practice court are required for graduation.

Undergraduate students in regular standing, candidates for the degree of Bachelor of Arts, electing Law as a major subject at the beginning of the Junior year may count not to exceed two years of the law course toward graduation and the degree of Bachelor of Arts. Those who have thus obtained the degree of Bachelor of Arts conferred at the end of four years, may receive the degree of Bachelor of Laws at the end of the fifth year on the completion of the third year of the Law course.

FEES AND EXPENSES.

Matriculation fees of $10 per week must be paid on the first day of registration in each academic year by all students except those holding honor scholarships from accredited high schools.

An Incidental fee of $5.00 per year must be paid on the first day of registration in each academic year by every student.

Tuition fees in the Law School are $40 per year, or $20 per semester. To those carrying less than ten semester credit hours of Law courses, the tuition charge will be $5.00 per course. Tuition fees must be paid on the official registration day or the first day of registration in each semester. Pre-legal students are not required to pay tuition fees until they enter the Law courses.

The cost of text books in the Law courses will average twenty dollars per year for the three years of the professional curriculum.

PRIZE SCHOLARSHIPS OF FREE TUITION.

A limited number of scholarships of free tuition in the law school have been authorized by the Board of Education and will be awarded to deserving students who distinguish themselves in

practice court, in debate, in writing briefs, or in other lines of law school work.

CASE-SYSTEM AND PROBLEM METHOD.

The case-study system, the discussion of law as applied to the facts of reported cases, is generally followed; but each instructor employs it according to his own method, conducting his classes by the problem method or in any way that seems best adapted to the particular subject.

The "problem method" is a logical development of the case-system, which is now being evolved and tried out at Montana. It consists in submitting to the students the facts of concrete legal problems such as are usually employed in law school examination papers. The students are expected to look up the law, cite authorities, write opinions and solve these problems independently. It is believed that in many courses at least this is an important advance over the usual method of having the student passively read the ready-made solutions provided by the judicial opinions which are pre-selected and reprinted in the present case-books.

In the procedural courses, such as Pleading and Practice and Evidence, certain modifications of the case-system are employed.

OFFICE AND COURT PRACTICE.

A special effort is made to enable the student to acquire a creditable degree of skill and facility in conveyancing and the drawing of contracts, as well as in the art of pleading, practice and forensic activity. In connection with such courses as contracts, corporations, property, trusts, wills, the student will be expected to draft the ordinary legal documents of office practice. In the course on code pleading and in the practice court the actual pleadings and papers required in the different stages of cases on the law points involved will also be given.

THE PRACTICE COURT.

The law school graduate, even from the best law schools, is very apt to be much disappointed to find, on his admission to the bar, that he is almost entirely unfitted and unprepared to take up the ordinary practical work of his profession. He is ordinarily not even trained to use a law library or look up a point of law for himself, let alone taking up the trial of a lawsuit. All this is left to a post-graduate apprenticeship in a law office, in order that the professors may have time to elaborate their legal theories on all possible subjects.

The Faculty of Montana Law School, while appreciating the necessity of theoretical knowledge of fundamental principles of substantive law, yet believe that it is the duty of the law school to do more than is ordinarily attempted to train the student for

his every-day work and teach him how to handle himself well in court, manage the various phases of litigation, organize and conduct corporations, examine and pass on titles and execute the ordinary operations of actual practice.

The Montana Law School attempts to perform its duty in these respects by giving great attention to the "practice court," and also to the practical side in all the courses. It is believed that there is no other law school in the country which offers the student training in practice court work all through his law-school course.

An attorney who is not trained in advocacy and trial work in the law school, where experience can be gained without disastrous results, will find opportunities in his early practice or clerkship of very rare occurrence. In fact, most lawyers are office or business lawyers, and are incompetent to conduct a trial properly as has been pointed out by Mr. Francis Wellman. Yet there is no asset of greater value than the art of advocacy or skill as a trial lawyer.

Only a comparatively few law schools make a "practice court" a regular part of the law school work. Most of them leave such work to voluntary clubs, wherein it is mostly confined to debates on law points carried on only during one year.

In the Montana Law School the practice court is put on the basis of a regular course, required during the first, second and third years. It is presided over by the regular professors, all of whom assist in the work, and by practicing lawyers who are invited from time to time to sit as presiding judges.

The first year court is largely occupied with authority work, briefing, and the oral argument of questions of law, and the trial of criminal cases.

The second and third year courts devote themselves to the trial of issues of fact. In order to make the work realistic, many of the cases are founded on the enacting of a burglary or other transactions, in which the witnesses and parties are University students. Thus the questions raised at the trial relate to what was really said and done, with the sufficient local color to arouse interest and enthusiasm.

The student is required to prepare the evidence, collate the facts, interview witnesses and get up a careful trial brief. The course includes the entire conduct of actual cases from start to final judgment and also the appeal and presentation to the supreme court for review. This involves the issuance of summons, the drafting and filing of pleadings, the making of motions, the impaneling of the jury, the examination and cross-examination of witnesses, the arguments to court and jury, and all the other incidents of a contested trial.

Sessions of the court are held weekly for two hours in the afternoon or evening, and between sessions the cases are being

prepared and carried from stage to stage by the student-attorneys in charge under the supervision of the instructor, who gives personal guidance in the work.

CONVEYANCING.

In the course on conveyancing the work consists of the examination of a series of selected abstracts of title representing a great variety of transfers, such as probate and tax sales, as well as deeds and mortgages. A copy of each abstract is furnished to the members of the class, and written opinions are rendered on the defects and objections to title found, and the methods of curing the defects are worked out. Thorough work in this course ought to equip the student as a practical conveyancer.

ARGUMENTATION AND DEBATE.

A course in the theory and practice of debate is required of first year students. A good text on the art of debate is in the hands of the students and a part of the time is given up to the mastery of the theory of debate. The course also includes practical work in the writing of briefs on questions of public interest, and practice in extemporaneous argument of the leading political and economic questions of the day.

The aim is to develop readiness in speaking, to give freedom and ease on the platform, to teach careful and independent research, and to cultivate the logical processes of analysis and discrimination which underly all law work. It is a mistake to suppose that excellence in public speaking is simply the gift of nature and not the result of patient and persistent labor and study.

SPECIAL LAW LECTURES.

Practical talks are given from time to time by prominent lawyers and judges of the state, designed to acquaint the student with matters that they will be called upon to meet in practice. A splendid series of lectures on the Law of Municipal Corporations was given the past year by H. Lowndes Maury, Esq., city attorney of Butte, who has promised to repeat them the coming year.

COURSES OF INSTRUCTION.

The prescribed course of study extends over a period of three full years, and is so arranged as to require credits amounting to fifteen hours each week. The main body of this curriculum is of general application, designed to afford a preparation for the practice of Law in any jurisdiction or state. At the same time special attention in all courses will be given to the codes and decisions of Montana and the western states. The list of courses announced for the several semesters, with their credit hours, is as follows:

	First Sem. Credit Hrs.	Second Sem. Credit Hrs.
First Year—		
Contracts and Quasi-Contracts	3	3
Property I	3	3
Torts	2	2
Agency	0	3
Criminal Law and Procedure	3	0
Practice Court	2	2
Debate and Argumentation	2	2
Second Year—		
Pleadings and Practice	3	3
Constitutional Law	3	0
Equity II (Trusts)	0	3
Evidence	3	3
Irrigation Law	2	2
Probate and Administration	0	3
Sales	3	0
Practice Court	2	2
Examination of Title	0	1
Third Year—		
Appellate Practice	3	3
Conflict of Laws	2	2
Corporations	3	3
Mining Law	2	2
Bankruptcy	0	2
Municipal Corporations	2	0
Proof and Advocacy	1	1
Practice Court	2	2

DESCRIPTION OF LAW COURSES.

First Year.

CONTRACTS AND QUASI-CONTRACTS—This course deals with the fundamental principles underlying all agreements by which one person obligates himself to another, as preliminary to the study of the specialized forms of obligations that have their foundation in contract and are treated in separate courses. It embraces mutual assent and the formation of contracts, considerations and the grounds of enforcement, the reciprocal duties of contracting parties, the performance and discharge of these duties, and the various defenses to the enforcement of contracts.

Under the head of quasi-contracts is embraced all that very large class of obligations arising from benefits received or prejudice suffered at the hands of another, giving rise to a claim enforced as if there were a contract. The subject of damages for breach of contract is also considered in this course.

PROPERTY I—Introduction to the law of real property; acquisition of title by adverse possession and prescription; ejectment; transfer of title inter vivos; drawing of deeds, convey-

ancing and examination of abstracts; estates; easements; landlord and tenant; fixtures; drawing of leases; public land law. The endeavor will be made to present the entire subject as a living branch of the law from the point of view of the present-day lawyer.

TORTS—Trespass to the person, to real property and to personal property; excuses for trespass; conversion; legal cause; negligence; contributory negligence; duties of landowners; nuisance; hazardous occupations; liability for animals; deceit; slander; libel; privilege; malice; malicious prosecution; interference with business, unfair competition, strikes, boycotts, business combinations; measure of damages in tort.

AGENCY—Nature of relation; appointment; liabilities of master for servant's torts; scope of authority to bind principal by contract; undisclosed principal doctrines; delegation of agency; termination; ratification.

CRIMINAL LAW AND PROCEDURE—Analysis of criminal act and criminal intent; causation; conditions of criminal responsibility; analysis of particular crimes with especial reference to the Penal Code of Montana; criminal procedure under the code.

DEBATE AND ARGUMENTATION—See description above. Required of all first year students.

PRACTICE COURT—First year; library practice in the use of law books, and the search for authorities; brief-making and the oral argument of questions of law; trial of criminal cases.

Second Year.

PLEADING AND TRIAL PRACTICE—Nothing is more difficult or embarrassing to the graduates of most law schools than to draw pleadings and prepare for the trial of a case. Unusual attention is given by an experienced practioner to teaching both the science and the art of successful pleading, and the function it plays in the actual case itself, both at the trial and on appeal. By exercises and actual practice in the drawing of pleadings of all kinds the student acquires a practical knowledge of how to plead logically, accurately and scientifically. Upon all points Montana cases are frequently cited and references made to the most interesting and instructive modern cases in other jurisdictions.

THE SECOND-YEAR PRACTICE COURT—In this course careful attention is paid to the actual preparation and trial of the more common and usual civil cases, such as torts (including trespass, negligence, libel and slander, nuisance, conversion, malicious prosecution, etc., etc.), contracts and property actions; the proper selection of the jury, the opening arguments of counsel, the examination and cross-examination of witnesses, the arguments for and against various demurrers, motions, instruc-

tions, etc., are critically gone through with and step by step performed by the student, so that he may learn how to try his cases in a skillful, experienced manner by actually doing it under proper criticism and supervision.

EQUITY II. TRUSTS—Nature and requisites of trusts with respect to consideration, subject matter or trust res, the trustee, the cestui que trust; sufficiency of language in wills and deeds to create trusts; kinds of trusts; express, constructive and resulting; private and charitable trusts; transfer of the respective interests of trustee and cestui que trust by act of party, by death, etc.; rights and remedies of creditors of the trustee and cestui que trust; priorities and bona fide purchase for value; resignation or removal of the trustee; dissolution of the trust by consent; duties of the trustee as to general execution of that trust and as to investment of the trust funds.

EVIDENCE—Theory of the law of evidence; method of introducing evidence; burden of proof; functions of judge and jury; relevancy, admissibility, rules of exclusion.

Practice or application of the rules of evidence; actual practice in the examination and impeachment of witnesses, the presentation of documents, and the raising of objections to the admission of evidence.

PROBATE AND ADMINISTRATION—Probate procedure; executors and administrators, appointment, powers and duties; sales and conveyances.

CONSTITUTIONAL LAW—American constitutional law; state and federal; federal jurisdiction; citizenship; fundamental civil and political rights; due process of law; police power; eminent domain; taxation; ex post facto and retroactive laws; laws impairing the obligation of contracts; regulation of commerce; treaty making power; government of territories.

Open to students well prepared in History, Economics and Political Science.

SALES—Transfer of title; bills of lading and jus disponendi; seller's lien and right of stoppage in transitu; fraud; warranty, express and implied; remedies for breach of warranty; conditional sales; statute of frauds.

IRRIGATION LAW—This course traces the genesis and development of the law of water rights in the west; how rights to the use of water may be acquired and retained, and generally, the law of waters as applied to irrigation, mining, manufacturing and the generation of power. Special attention will be given to the preparation of water right litigation, and instruction as to the actual trial thereof.

Third Year.

APPELLATE PRACTICE—The course in appellate practice

covers motions for a new trial as well as appellate practice proper; the ordinary proceedings for review being motions for a new trial in the court which rendered the decision, and appeals to a higher court. The course includes investigation into the grounds for new trial, the various papers upon which the motion may be made, and actual practice in the preparation of the motion and argument thereon. The appellate jurisdiction of the various courts is considered, what judgments, orders and proceedings may be appealed from, parties who may appeal, time within which appeal may be taken, and then the various steps by which the appeal is taken. Actual practice will be given in preparing the record proper and the bills of exceptions. Besides this other modes of review will be studied such as Writ of Error, Writ of Certiorari, Writ of Prohibition, Writ of Mandamus, Writ of Habeas Corpus, and the Montana Writ of Supervisory Control.

CONFLICT OF LAWS—Jurisdiction, territorial and personal; domicile; situs; creation of rights, especially rights arising from tort and contract; recognition of rights; foreign executors and administrators.

PROOF AND ADVOCACY—The process of proof; the weight of the evidence; estimating the credit of witnesses; principles of advocacy and legal strategy.

CORPORATIONS—Formation and organization of corporations; irregular and de facto incorporation; corporate powers and ultra vires; promoters; directors; stockholders; creditors; stock issue, payment, transfer; assessments and calls; dissolution; foreign corporations.

BANKRUPTCY—Effect of bankruptcy act on state insolvency laws; voluntary and involuntary proceedings; acts of bankruptcy; what property passes to the trustee; proof of claims; exemptions and discharge; composition; procedure.

MINING LAW—The course will cover the history of mining in the west; the law relating to the acquisition of mining rights and claims upon the public domain; how such rights may be retained and continued; the perfecting of full legal title thereto. Also the law relative to incidental rights growing out of a location or patent of a mining claim—including the law of cross veins, tunnel claims, extralateral rights, etc. And generally, the law relative to the operation of such mines; field practice in the location of mining claims; applications for patent.

MUNICIPAL CORPORATIONS—Nature of municipal corporations; corporate capacity; self government; creation, annexation, division; dissolution; succession; legislative control; officers and agents; governmental functions; municipal police power; quasi-governmental and commercial functions; local improvements and services, including special assessments; public streets;

liability for torts; liability for contract; indebtedness and its constitutional limit; remedies of creditors.

THIRD-YEAR PRACTICE COURT—See description of second year court above.

EXTENSION DEPARTMENT

THE UNIVERSITY EXTENSION IDEA.

Through this department of its work the University of Montana plans to give practical assistance to the teacher, the student, the mechanic, the professional and business man. It seeks especially to serve those who are unable to attend established educational institutions, giving every citizen of the state an opportunity to get the best education possible at the least practical cost, carrying the advantages of the University to all the people of the state.

Not all the advantages or classes of instruction offered by the University can thus be brought to citizens of the state because of the lack of funds to carry on the work. Only a limited amount of Extension and Public Welfare work can at present be done. But it is the purpose of the University to extend this feature of its work as rapidly as possible.

I. CORRESPONDENCE STUDY.

GENERAL INFORMATION.

1. FOR WHOM INTENDED—There exists in every community a considerable class of persons who are unable to continue their study in regular school and university courses. Yet they desire to keep abreast of the times with reference to the advances of knowledge which relate to their own profession or businss; some wish to pursue courses for their own culture; others wish to acquire units of credit toward a University degree or to finish work required for entrance to the University. The Correspondence Study Department of the University seeks to serve their needs by offering effective individual instruction which can be pursued in accordance with the requirements of each student in his own home.

2. ADMISSION AND REGISTRATION—No preliminary examination or proof of previous work is required of an applicant for Correspondence Work. A student desiring to undertake Correspondence Study should first select such course or courses as he may desire to take, and send for a registration blank. He should then fill out this blank with the information called for, and return it with the required fee to the Extension Department of the University. The University reserves the right to reject unsuitable applicants or to recommend other courses than

those chosen if the data furnished on the application blank should warrant such action, but it will promptly return all fees if the applicant is rejected, or if the substitution of courses recommended is not acceptable to the student. (See Regulations below.)

3. METHODS OF INSTRUCTION—Upon receipt of application blank and fee, the first lesson assignment will be sent, with directions for study and instructions for preparing and returning lesson sheets and reports. Each lesson will be returned to the student with such corrections, explanations and suggestions as the instructor may think the student needs. The lesson sent to the student will contain: (1) Full directions for study, including references to text books by chapter and page; (2) questions to test the student's method of work and his understanding of the ground covered; (3) lists of books and assignments for further reading and such other suggestions and helps as the instructor thinks the student needs. After careful preparation of the lesson sent, the student writes his answers to the question or prepares the assignment as directed and mails them to the instructor together with any statement of difficulties which may have arisen during his study. Questions on the subject in hand are at all times encouraged and will receive the careful attention of the instructor. The student's recitation paper is corrected as promptly as possible and returned to the student. All lessons are thus carefully criticised by the instructor so that each student receives personal guidance and instruction throughout the course.

4. THE UNIT COURSE—All Correspondence Work is based upon the Unit Course, which consists of 35 assignments and is the equivalent of the work of a resident student for five hours per week for one semester or half year. A Unit Course may, however, consist of one or more subjects or courses each embracing 1-5, 2-5, or 3-5 of a full course and representing 7, 14, 21 assignments, or 1, 2, 3 semester hours of credit. It is believed that a full Unit Course or its equivalent should be completed by the average student in thirty-five weeks on a minimum of leisure for study of one hour per day, six days in the week. The student may, however, pursue his studies as rapidly as he is able.

5. THE LESSON—Each course, therefore, consists of a definite number of assignments, 14, 21, or 35, depending upon the number of credit hours represented by the course. An assignment represents in general about a week's work for the average student, not an evening's work, as at school.

6. EXAMINATIONS—Examinations are optional with the student, but are required if credits or certificates of credit are sought. These examinations should be taken at the University, but may be held at some other convient place approved by the University.

7. RECOGNITION OF WORK—(a). All courses offered by the Correspondence Department, whether taken for University credit or not, are on a uniform basis in reference to amount of work covered. Courses which are satisfactorily completed have, therefore, a definite value, and all students who successfully complete such courses will be given a certificate of credit for all work satisfactorily completed.

(b). Credits toward graduation will be given by the University for work done in Correspondence Courses of collegiate rank if satisfactory examinations have been passed.

(c). Credit records for all Correspondence Courses successfully completed will be kept in the office of the University and may, if the student enters the University, be applied toward entrance or graduation requirements.

(d). The maximum credit which may thus be earned by Correspondence Study may not exceed one-half the unit hours required for graduation. At least one year or four summer sessions amounting to not less than 24 credit hours of work must be done in residence at the University.

(e). At the completion of each Correspondence Study Course, taken for University credit, the student must pass an examination held at the University under the direction of the instructor giving the course, or at some other convenient place under conditions approved by the University.

(f). In special cases where students are mature and beyond the high school age, credit is allowed for Correspondence Study Courses of preparatory grade to satisfy entrance requirements to the University.

8. REGULATIONS—(a). Correspondence Courses may be begun at any time during the collegiate year.

(b). For admission to the Correspondence Study Department no examination is required, but the student is required to fill out a regulation blank, giving such information as may be helpful to the instructors in adapting the work to the needs of the student.

(c). Students who undertake Correspondence Study Work for University credit must comply with all the requirements of the University and make known this intention in advance.

(d). Correspondence students are expected to complete a Unit Course within twelve months, two courses within fifteen months, and three courses within eighteen months from date of registration.

(e). No fee is refunded because of a student's inability to finish a course for which he has registered. If an application for instruction cannot be met by the University or is for any cause rejected by the University, the fee is returned.

9. EXPENSES—The fees for Correspondence Courses are payable in advance and are as follows: $10 for any one course;

$16 for two courses taken together; $20 for three courses registered for at one time. These amounts cover the cost of the necessary outlines, laboratory materials, etc., but do not cover the cost of the necessary text books which may be purchased from the Extension Department of the University at cost. The fees for this work have been fixed at the lowest possible rate, as the motive is purely one of public service.

COURSES OF INSTRUCTION.

The Correspondence Courses now arranged for and as outlined below will appeal especially to teachers, engineers, mechanics, foresters, business men, citizens, and various classes of students.

ART.

1. HISTORY OF PAINTING IN THE ITALIAN RENAISSANCE—This course will cover the growth of painting in Italy from the time of Giotto to its decadence. Two credit hours. Miss Knowles.

2. ELEMENTARY DRAWING AND PAINTING—Instruction will be given in object drawing and shading, in sketching from nature, in the principles of perspective, and in the technique of water color painting. While this course does not purpose to teach methods, it will be found of value to the teacher who desires to become proficient.

Two credit hours; Miss Knowles.

ECONOMICS.

1. ECONOMIC PRINCIPLES—A study of the economic process of producing and distributing wealth; interest, rent, wages, with a view to the application of these principles to the study of current economic questions. Ely's Outlines of Economics will be required as a text-book. Other books will be read on specified subjects. Professor Underwood.

2. BUSINESS ORGANIZATION—A study of financial institutions, e. g., trust companies, building associations, insurance companies; the organization and problems of corporations, as capitalization, bonding reserves, monopoly; stock exchanges, brokerage; investments. Professor Underwood.

EDUCATION.

HISTORY OF EDUCATION—This course gives a general survey of the evolution of educational idals and school systems from savagery to the present time. The presentation of the subject shows the relation of educational ideals to the contemporary industrial and social conditions, traces the chief stages in the development of theory and practice and forms the basis for evaluating present day problems in education.

Five credit hours; Professor Kemp.

ENGLISH.

1. AMERICAN PROSE AND VERSE—A survey of American literary history, and other discussion of notable works in prose and in verse. Stress is laid on the individual writers, particular attention being given to the literature of the nineteenth century.

Three credit hours; Professor Corbin.

2. ENGLISH COMPOSITION—Theme writing for students who have had at least a high school course in English. Each assignment will include a prescribed selection for reading, and a theme based upon it of 200-50 word

Three credit hours; Professor Reynolds, Mr. Palmer or Miss Stewart.

Students desiring to take this course must before registration submit 200-300 words in writing to the Department of English, to demonstrate their fitness. This may well be in the form of a letter describing their previous work in English and their purpose in taking this course.

GEOLOGY.

1. ELEMENTARY MINERALOGY—This course will deal with the common ordinary minerals found in nature. They will be studied purely from a physical standpoint and will require no knowledge of Chemistry. It is intended that 150 to 200 minerals will be studied during the year. The minerals will be taken up along their commercial lines and the course is not only arranged for those desiring a general knowledge but also for those wishing to get a practical knowledge of minerals. It is therefore meant for general students, miners, prospectors, etc. Mineral specimens will be sent to the students taking this course and the text to be used will be Rowe's Practical Mineralogy Simplified. A fee of $2.00 will be required for the use of specimens. One-half hour of credit will be given for the completion of 100 minerals; another one-half hour credit will be given for the completion of the remaining minerals found in the text.

Professor Rowe.

GERMAN.

1. GERMAN COMPOSITION AND READING—The work offered will be taken up individually with those applying. Prerequisites: The ability to read easy German at sight (such work as "Immensee," "Hohr als die Kirchie." No work in beginning German will be given.

Three credit hours.

HISTORY.

1. HISTORY OF EUROPE—Influences contributing to the history of Europe; European institutions and civilization; Renais-

sance and Reformation; development of the modern European states system; growth of nationalism and democracy; present day socialism; the peace movement. Syllabus and readings.

Three credit hours; Dr. Phillips.

2. AMERICAN HISTORY—Settlement of the colonies. Types of colonial governmnt and organization. Conflict with Great Britain. Formation of constitution and government. The Federalists and Jeffersonian Republicans. Political parties and slavery. Growth of nationality. Assigned readings and reports.

Three credit hours; Dr. Phillips.

LATIN.

1. LATIN COMPOSITION AND READING—Courses in reading Latin and in Latin composition will be given; college work only. The authors read and the kind of composition work will depend upon the preparation and desires of the applicants.

Three credit hours; Professor Aber.

MATHEMATICS.

PROFESSOR L. C. PLANT, INSTRUCTOR E. F. A. CAREY.

Academic Courses.

1. ELEMENTARY ALGEBRA—This course begins with the the fundamentals of the subject and continues through quadratic equations. One entrance unit.

2. ELEMENTARY ALGEBRA—A continuation of Course 1, with a repetition of some of the topics therein contained treated more exhaustively. One-half entrance unit.

3. PLANE GEOMETRY—The fundamental propositions of plane geometry are demonstrated with the aim of placing the student in possession of methods of attacking "original exercises." One entrance unit.

4. SOLID GEOMETRY—The minimum number of propositions with application to mensuration. One-half entrance unit.

5. TRIGONOMETRY—Definitions of the trigometric functions; their properties and solution of triangles. One-half entrance unit.

Collegiate Courses.

1. COLLEGE ALGEBRA—This course aims to give a clearer insight in the academic mathematics as well as lay the foundation for more advanced mathematics. Three credit hours.

2. ANALYTIC GEOMETRY—A treatment of the important properties of the several conics, including a discussion of a few of the more interesting curves.

Three credit hours.

3. DIFFERENTIAL CALCULUS.

Three credit hours.

4. INTEGRAL CALCULUS.

Three credit hours.

The ground covered in courses 3 and 4 is the equivalent of that included in a standard text.

5. MECHANICS—Composition and resolution of forces; the principles of equilibrium; application of the principles of states to simple machines; brief discussion of graphical statics with applications to structures.

Four credit hours.

6. TEACHING OF MATHEMATICS—A critical review of secondary mathematics, including a discussion of current developments in methods of teaching.

Two credit hours.

Practical Mathematics.

1. SHOP MATHEMATICS—This course aims to meet the needs of those engaged in Mechanical Engineering trades.

One credit hour.

2. MATHEMATICS FOR FORESTERS—This course deals with such subjects and problems as are of practical use to the forester.

One credit hour.

3. CONSTRUCTIVE GEOMETRY—This course is given primarily for forest rangers and mechanics who have not had a course in geometry. It consists in part of drawing to scale a large number of geometrical figures by means of which theorems are deduced. These theorems are then applied to practical problems.

One credit hour.

PHYSICS.

1. ELEMENTARY PHYSICS—In this course we are trying to meet the needs of three classes of persons; those actively engaged in teaching the subject; those making preparation for first grade or professional cretificates, and those looking forward to entrance to the University.

The work of this course will consist of the study of some suitable text-book, the solution of assigned problems and exercises. Should the candidate desire credit for this subject toward entrance to the University, a note-book containing the results of about fifty assigned laboratory problems must be submitted in addition to an examination on the text-book used. The laboratory work may be carried along with the text-book study if the candidate has access to a high school laboratory or may be taken later at the University Summer School.

One entrance unit; Professor Thompson.

PSYCHOLOGY.

1. ELEMENTARY PSYCHOLOGY—A general introductory course acquainting the student with the main facts of mental life. It will give the necessary basis for future work in Philosophy and Education. Some attention will be givne to the applications of Psychological laws to education and life.

Professor Bolton.

ZOOLOGY.

1. ZOOLOGY. INVERTEBRATES—The study will include examination of specimens representative of the various invertebrate types. The lessons will cover anatomy and morphology, physiology, ecology and distribution of species. To clearly present the idea of organic evolution and to develop methods of working and thinking will be the ends sought.

Four credit hours; Professor M. J. Elrod.

2. ZOOLOGY. VERTEBRATES—Following the same general plan as for invertebrates. Material included will be the lowest vertebrates, the fish, frog, bird, rabbit or squirrel, etc., not merely from anatomical standpoint, but from broad view as given above. Material from the University will be furnished at cost.

Four credit hours; Professor M. J. Elrod.

3. PHOTOGRAPHY—A study of the camera, the dark room, plates, lenses, ray filters, papers, development and reducers, followed by work in making lantern slides, copying, enlarging, making transparencies, and the like. A camera and dark room will be necessary. Working material will be furnished at cost.

Two credit hours; Professor Elrod.

ENGINEERING.

PROFESSORS RICHTER, PLEW, BIEGLER AND CUNNINGHAM.

1. SHOP CALCULATIONS—Rules and problems of practical value to machinists, consisting of estimates of speed, size and strength of gears, pulleys, shafting and belts, etc. Calculating horse power of engines and boilers.

Two credit hours.

2. DRAWING—Free hand lettering, use of instruments, fundamentals of mechanical drawing. Assembled and detailed drawing of machines and machine parts, tracing, sketching, etc.

Two credit hours.

3. COMPASS SURVEYING—A course for forest rangers, covering the uses and adjustments of the surveyor's compass; methods of measurement, chaining, and pacing; calculating areas, and

error of closure by latitude and departure method. Public land surveys. Prerequisite: Mathematics IV.

One credit hour.

4. TRANSIT SURVEYING—A continuation of compass surveying, taking up the use of note keeping, lettering, mapping and computations. Observations on Polaris for the meridian. Prerequisite: Engineering 3.

Two credit hours.

5. HEAT—A study of the principles of the mechanical theory of heat, leading to a study of the various forms of steam, gas, producer gas, gasoline and oil engines.

Three credit hours.

6. HEAT ENGINES—A study of the theory, construction and operation of steam, gas, gasoline and producer gas engines, steam turbines. The choice of engines for power stations. Testing of power stations and power station machinery to determine cost of operation. Prerequisite: Heat 5.

Five credit hours.

7. POWER STATION FUELS—A study of the various kinds of fuels used in power stations. Determination of the heating value and analysis of coals, city and producer gas and other fuels. Boiler economy.

Two credit hours.

8. DIRECT CURRENTS—A study of the usual forms of direct current machinery and receiving apparatus, together with numerous illustrative problems. The choice of apparatus for power stations and distribution systems is emphasized.

Five credit hours.

9. ALTERNATING CURRENTS—The same as described in "Direct Currents" applied to Alternating Currents, including a study of high tension transmission. Prerequisite: A knowledge of the calculus.

Five credit hours.

II. INSTRUCTION BY LECTURES.

1. THE STATE UNIVERSITY IDEA—The idea that a University is a place where any one may come and study anything under proper conditions and guidance has in recent years been supplementd by the ideal of the modren State University which seeks to offer to any one anywhere within the borders of the state the opportunity of studying anything he chooses under the helpful and stimulating guidance of a specialist.

Instruction by lectures is, therefore, one of the ways by which a State University may be of service to the state, stimulating learners here and there, bringing to them the light of truth and learning represented by a University.

The University of Montana can not, at present, establish a

state-wide free lecture course, but it is able to offer through its Extension Department some Lecture Instruction in practically all the departments represented at the University. It is the plan to place Lecture Courses of two, three, five or more lectures in as many of the hundred villages, towns, and cities of the state as possible.

2. AIM OF THIS LECTURE INSTRUCTION—The instruction by lectures offered by the University Extension Department, while planned to appeal to all classes of society, is, nevertheless, educational in every particular. The University is not establishing an entertainment bureau, but aims to bring to the citizens of the state such messages of information and inspiration as will be educative and uplifting.

3. METHOD OF INSTRUCTION—The general plan pursued in this lecture instruction is as follows: There will be a University lecture or series of lectures given by a member of the University Extension Staff. Each lecture will be followed, in the case of those desiring to do more extensive work, by a discussion of the syllabus prepared by the instructor and the results of the assigned readings. Written work will also be assigned to those who desire more lasting educational results from the work. Not all will care to follow this entire program, but there will be few to whom the program does not offer something. Some will have time only for the lectures, while others may wish to do some outside reading and attend the meetings of the study club.

4. APPLICATIONS FOR LECTURES—All applications for University Extension Lectures should be made to the Director of Extension Work, University of Montana, Missoula, or to the President of the University. The members of the Extension Staff may be secured for single lectures or for a course of lectures as announced below. In some cases they may be had for any day in the week but for places at a considerable distance from Missoula and whenever possible lectures should be arranged for the last two days of the week. Committees desiring lectures should in every case, indicate a first and second choice for lecturer, subject and date. Every effort will be made to meet their wishes.

5. STUDY CLUBS—The Extension Department of the University stands ready to assist all study clubs within the state, either in supplying them with the desired Lecture Study Courses or in helping them stimulate interest in this sort of educational work. It will also gladly assist local centers in organizing and perfecting the organization of such clubs wherever possible.

6. UNIVERSITY CREDIT—Lectures may be attended by those who desire to be hearers or by those who wish to do systematic reading and who may be looking forward to enrolling in

the University. Where the study work of the club is of a character approved by the Faculty of the University, a certificate of credit may be awarded to those passing a satisfactory examination, a certificate entitling them to University credit should they ever study at the University.

7. COMMENCEMENT ADDRESSES—The Extension Department of the University will be glad to arrange for commencement addresses to be delivered by members of its staff. The charges for these lectures will in each case depend upon the speaker desired.

8. HIGH SCHOOL EXTENSION—One or more educational and scientific lectures by members of the Extension Staff may be arranged for by the various high schools of the state free of cost to the local schools. Inquiries regarding this work will receive prompt attention by the committee.

9. EXPENSE—There are no fees to be paid to the University or its lecturers for Extension Lecture Courses. The University pays the salaries of its lecturers and all traveling expenses. The cost to any organization for obtaining these lectures is, therefore, limited to local expenses—for hall, printing, hotel charges, etc. These liberal terms can now be offered because the state granted a special appropriation to develop Extension Work.

EXTENSION LECTURES.

ART.

INSTRUCTOR ELOISE KNOWLES.

1. RENAISSANCE PAINTING—One or three illustrated lectures. (1) The Zenith of the Italian Renaissance; (2) Three Venetian Artists; (3) Dutch and Flemish Painting.

2. RECENT AMERICAN ART—One or three illustrated lectures. (1) Recent American Sculpture; (2) American Landscape Painters; (3) Recent Mural Paintings.

BOTANY.

PROFESSOR J. E. KIRKWOOD.

Three single lectures, which may also be given in groups.

1. MEXICAN PLANTS AND PEOPLE—An illustrated lecture dealing especially with the plateau region of Central Mexico.

2. ARIZONA AND THE DESERT COUNTRY OF THE SOUTHWEST—An illustrated lecture on the cactus country.

3. EVERGREENS, THEIR HABITS AND DISTRIBUTION—(Illustrated.)

ECONOMICS.

PROFESSOR J. H. UNDERWOOD.

1. THE SOCIAL QUESTION—Six lectures. (1) The Social Question, a question of economic distribution; (2) The Answer of Economics, the theory of competition and "individualism"; (3) The Answer of Socialism, the theory of co-operation; (4) The Answer of Business, the development of economic organization; (5) The Answer of the Church, the ideal of altruism; (6) The Answer of Sociology, synthesis and sociability.

2. THE FACTORS IN SOCIAL PROGRESS—Six lectures. (1) Physical and Economic, competition; (2) Economic, co-operation; (3) Ethical, altruism; (4) Intellectual, the "Social Mind"; (5) The Social Order, a balance of Interests; (6) The Social Ideal, rational progress.

EDUCATION.

PROFESSOR W. W. KEMP.

1. CONTEMPORARY EDUCATIONAL IDEALS—Six lectures. (1) Education as process of Acquisition and Learning; (2) Education as process of Unfoldment or Development; (3) Education as process of Training and Discipline; (4) Education as Adjustment; (5) Education as Preparation for Social Efficiency and Service; (6) The Problem of the Teacher and the School.

2. CONSERVATION OF BOYS AND GIRLS—One lecture.

3. CHANGES IN AMERICAN LIFE AND EDUCATION—One lecture.

4. MODERN EDUCATIONAL PROBLEMS—One lecture.

5. MONTANA YOUTH AND FUTURE OPPORTUNITY—One lecture.

6. HYGIENE IN RELATION TO SOCIAL AND MORAL UPLIFT—A course of lectures devoted to the new movement of sex education and the application of the teachings of hygiene to social and moral betterment. Professor Kemp will be assisted in this course by President Craighead and members of the University Faculty, and by some of the leading physicians and educators of the state. The following lectures will be included in the series: (1) A survey of the general need for an extended knowledge of Social Hygiene; (2) The Biological basis of heredity; (3) The Laws of Sex and Reproduction; (4) The Medical View of Venereal Diseases; (5) Economic Pressure—wages, the cost of living, and social vice; (6) The Place of Playgrounds and Amusements; (7) The Problem in relation to Law and the Function of the state; (8) School Administration and Instruction in matters of Sex and Training of Teachers; (9) The Pedagogy of Instruction in Sex and Reproduction; (10) Sex Education and the Educa-

tion of Children; (11) Sex Education and the Education of Adolescent Boys and Girls; (12) Social Hygiene in Relation to Morality and Religion—The Function of the Church.

ENGLISH.

PROFESSOR G. F. REYNOLDS.

1. THE ART OF DRAMA—A course of six lectures. (1) Suderman's "Magda"; (2) A Story and a play; (3) The First Act; (4) Contract in Drama; (5) The Theme; (6) The Play and the Playhouse.

2. THE ENGLISH LANGUAGE—One lecture.

3. THE POETRY OF ALFRED NOYES—One lecture.

4. THOMAS HARDY'S DYNASTS—One lecture.

5. JOSEPHINE PRESTON PEABODY'S "THE PIPER"—One lecture.

INSTRUCTOR G. M. PALMER.

1. THE ROMANTIC PERIOD—A course of four lectures. (1) Romanticism; (2) The Romanticists in Politics, Rousseau taken as a type; (3) The Romanticist in Religion, Cardinal Newman as a type; (4) A Type of Pure Classicist, Edmund Burke.

2. THE EARLY ROMANTICISTS—As many lectures as desired, including such names as Thompson, Young, Gray, Walpole, MacPherson, Chatterton, etc. One lecture on each or a lecture for two as desired.

3. THE PHILOSOPHY OF TENNYSON—One lecture.

4. THE PHILOSOPHY OF EMERSON—One lecture.

5. THE NEW JAPAN—One lecture.

7. THE NEW CHINA—One lecture.

8. AMERICAN EDUCATION IN THE PHILIPPINES—One lecture.

MISS MARY STEWART.

1. THE DEVELOPMENT OF THE NOVEL—Four or six lectures. A general survey of the rise and growth of the novel as a literary form, together with interpretation of various types of the "great novel."

2. JEAN VALJEAN—One lecture.

3. PARIS—One lecture.

GEOLOGY.

PROFESSOR J. P. ROWE.

Three lectures to be given singly or in groups.

1. GLACIERS, MOUNTAINS AND VOLCANOES. (Stereopticon.)

2. MINERALS AND ROCKS AND HOW TO KNOW THEM —Illustrated by specimens.

3. ANIMALS BEFORE MAN. (Stereopticon.)

PSYCHOLOGY.

DR. THADDEUS L. BOLTON.

1. OUR PECULIAR AND BACKWARD CHILDREN—This lecture is given with a stereopticon. It deals especially with the laggards and subnormal children in our schools. The various types of physical defect and arrested growth as they affect mental development will be shown on lantern slides and the nature and causes of these disorders will be explained.

2. THE SIGNIFICANCE OF PLEASURES AND PAINS FOR GROWTH AND MENTAL HEALTH—This lecture will deal with the effect upon the body of the states of pleasure and pain. It is a popular exposition of the advance that has been made in modern psychology in the study of human life as it is affected by agreeable and disagreeable experiences.

3. ON THE METAMORPHOSIS OR MOLTING OF BOYS AND GIRLS—This is a study of adolescence. It presents the processes of change that take place in boys and girls as they transform themselves from children into men and women and it attempts to show the dangers that beset life at its critical periods.

4. THE PSYCHOLOGY OF THE AMERICAN PEOPLE—The development of those traits of mind that characterize the American people is worked out historically and on the principles of modern psychology. We should be ashamed of ourselves if we were not Americans.

5. A COURSE OF LECTURES ON HOW WE LEARN—The course will consist of three or more lectures on the processes of learning. These lectures are both popular and scientific, suitable for audiences of general culture. They attempt to present the principles of learning and to point the way toward more economical learning and teaching.

6. A COURSE OF LECTURES UPON SOCIAL PSYCHOLOGY—This course will cover as many lectures as a club or society might wish to hear upon the psychology of society as we see it about ourselves. It is a study of people just as they are laying bare their motives and springs to action. Any one of the lectures may be given alone.

7. PSYCHOLOGICAL ASPECTS OF LITERATURE AND LITERARY APPEAL—This lecture attempts to analyze literature from the standpoint of psychology and evaluate the various elements that enter into it as to their power of appeal or

to entertain. It is a study of the psychological foundations of the art of writing.

8. THE SOCIAL VALUE OF SELF EFFACEMENT AND SELF SURRENDER—This is a popular lecture suitable for schools and churches upon the development of moral consciousness.

ZOOLOGY.

PROFESSOR M. J. ELROD.

Six illustrated lectures, which may be given singly or in groups.

1. THE GLACIAL NATIONAL PARK.
2. LEWIS AND CLARK IN MONTANA.
3. FORESTS AND THEIR UTILITY.
4. SOME WONDERS OF THE SEA.
5. BIRDS AS FRIENDS AND FOES.
6. GAME BIRDS AND ANIMALS.

III. GENERAL INFORMATION AND WELFARE.

1. PURPOSE—State Universities and institutions of higher learning cannot forget that those who contribute to their support have a right to share in all their fruits. In the study and consideration of all questions which concern the people of a state the State University should, therefore, play a leading role.

Much may be done by the departments of Education, History, Political Economy, Geology, Chemistry, Biology, Forestry, Law, etc., by way of collecting and disseminating useful information on the topics and questions of vital interest to the citizens of a state. The masses of technical and scientific literature may be carefully gone through by experts and the essential facts made available to the citizens of the state. The people of Montana may appeal to their University for needed information and help in the solution of all important questions where expert knowledge is valuable.

2. WHAT MAY BE DONE—The best literature and latest researches relating to food, public hygiene, sanitation and the prevention of disease may be made available through the help of the Departments of Bacteriology and Chemistry. Information and literature in regard to present economic, political, social and ethical questions may be furnished by the Department of Political Science. Much information and reference to the best literature relating to school hygiene, the construction of school houses, and general and special education can be provided by the Departments of Psychology and Education. Suggestions and literature relating to home furnishing and decorations and all forms of music and art may be supplied through the Departments of Music and Art. Much helpful information and the results of the latest scientific discoveries relating to all questions pertaining to mining and minerals may be provided by the Departments of Geology and Mineralogy. Information and reference to the best literature on such problems as conservation, recreation and social health, child labor statistics and laws, city government, water supplies, disposal of garbage, the abatement of noise, etc., can be furnished by other departments of the University.

3. WRITING FOR INFORMATION—By addressing the Registrar of the University the inquirer will obtain the services of the appropriate professor or department. No fees are charged for this work for public welfare.

SUMMER SCHOOL

OFFICERS OF THE ADMINISTRATION.

EDWIN BOONE CRAIGHEAD.
President of the University.

WILLIAM WEBB KEMP.
Director of the Summer School.

JAMES DENTON DUNLOP.
Registrar.

SUMMER SCHOOL FACULTY.

EDWIN BOONE CRAIGHEAD, LL.D., D. C. L., President.

FREDERICK C. SCHEUCH, M. E., A. C., Professor of Modern Languages.

MORTON JOHN ELROD, Ph. D., Professor of Biology.

FRANCES CORBIN, B. L., Professor of Literature.

JESSE PERRY ROWE, Ph. D., Professor of Geology.

JOSEPH HARDING UNDERWOOD, Ph. D., LL.D., Professor of History and Economics.

LOUIS CLARK PLANT, M. S., Professor of Mathematics.

ARTHUR WILLIAM RICHTER, M. M. E., Dean of the Engineering School.

JOSEPH EDWARD KIRKWOOD, Ph. D., Professor of Botany and Forestry.

GEORGE FULLMER REYNOLDS, Ph. D., Professor of English and Rhetoric.

WILLIAM WEBB KEMP, Ph. D., Professor of Education.

W. W. H. MUSTAINE, B. S., Director of Physical Education.

GUSTAV L. FISCHER, Professor of Music.

————————, Professor of Psychology (To be supplied).

————————, Professor of Domestic Science (To be supplied).

ROBERT NEAL THOMPSON, B. S., Assistant Professor of Physics.

WILLIAM R. PLEW, M. S., Assistant Professor of Engineering.

CHARLES H. WILLIAMS, M. A., Assistant Professor of Secondary Education.

WILLIAM G. BATEMAN, M. A., Acting Professor of Chemistry.

EUGENE F. A. CAREY, B. S., Instructor in Mathematics.

PAUL CHRISTOPHER PHILLIPS, Ph. D., Instructor in History.

GEORGE MERIT PALMER, M. A., Instructor in English.

————————, Fine Arts (To be supplied).

CHARLES C. ADAMS, Ph. D., Assistant in Animal Ecology, University of Illinois, Lecturer at the Biological Station.

PERLEY M. SILLOWAY, Superintendent of Schools, Virden, Illinois, Lecturer at the Biological Station.

GERTRUDE BUCKHOUS, B. S., Librarian.

GUSTAVE ADOLPH GROSS, Instructor in Engineering Shops.

CAROLYN E. MORRISON, Lecturer in Education of Exceptional Children.

HELEN HERRON, Professor in New Orleans Normal School, Professor in Summer School, Tulane University, Lecturer in Elementary Education.

IDA VANDERGAW, Method Supervisor, Oakland, California, Public Schools, Lecturer in Intermediate and Grammar Grade Methods.

ALMA L. BINZEL, Head of the Kindergarten and Primary Departments, State Normal School, Winona, Minnesota, Lecturer in Kindergarten and Primary Methods.

E. M. RAPP, Superintendent of Schools, Berks County, Pennsylvania, Lecturer in Rural Education.

SPECIAL LECTURERS.

HON. JOSEPH M. DIXON, Ex-United States Senator from Montana.

HON. H. A. DAVEE, Superintendent of Public Instruction in Montana.

WALTER MILLER, Dean of the College of Arts and Science, University of Missouri, Columbia, Mo., Illustrated Lectures on the Civilization and Art of the Greeks.

LIGHTNER WITMER, Professor of Psychology, University of Pennsylvania, Education of Exceptional Children.

JOHN DIETRICH, Superintendent of Schools, Helena, Montana.

OLLIE J. KERN, Superintendent of Schools, Winnebago County, Illinois, Education for Country Life.

FLORENCE E. WARD, Lecturer in Education, Upper Iowa Teachers' College, Montessori System of Education and its Application to American Conditions.

MARY POWELL JORDAN, M. D., formerly of State Normal School, Cheney, Wash., Lecturer on Montessori System of Education.

It is impossible at this time to give a complete list of special lecturers of the Summer School. A number of eminent Educators of the United States and England have been invited to participate in the session, but complete arrangements have not yet been effected.

GENERAL INFORMATION.

Location and Climate:

The City of Missoula is beautifully located on the Missoula river at the mouth of the Bitter Root Valley. The elevation of 3,200 feet, the immediate proximity to mountains, forests and beautiful streams, give the University of Montana exceptional climatic advantages for the holding of a Summer School.

The Northern Pacific and the Chicago, Milwaukee and Puget Sound Railways bring Missoula in close touch with all parts of Montana.

Purposes of the Summer School:

The Summer School is intended to meet the needs of all persons who wish to spend part of the long vacation in intellectual acquisition, using the equipment, organization and faculty of the State University. It especially appeals to:

Superintendents, Principals and Teachers who wish (1) to improve their professional equipment; (2) to do residence work for credits towards degrees; (3) to increase their knowledge and renew their enthusiasm. They may take courses applying on the University Certificate of Qualification to Teach in High Schools. This certificate renders teachers' examinations unnecessary.

Graduate Sudents who wish to study in residence for higher degrees with the exceptional privileges of direct and personal contact with professors in libraries and laboratories. Courses more advanced than those herein listed may be arranged upon application.

Undergraduates who wish (1) to shorten their university course, by using the Summer School to complete the four years' course of the University in three and one-half or even three years; (2) to broaden the field of their studies; (3) to meet the requirements of University Certificates of Qualification to Teach; (4) to overcome handicaps of preparation and entrance conditions.

High School Students who wish (1) to complete a high school course, already almost finished; (2) to begin University work without waiting until September.

Correspondence Students who wish to do some work in residence.

Any person who wishes to spend vacation weeks in intellectual acquisition.

The Faculty:

A corps of thirty-six or more professors and instructors, two-thirds from the University staff, and one-third from other institutions, will give courses in twenty-two fields of work.

Scope of Courses:

Instruction will be given in the following fields:

Biology, Botany, Chemistry, Domestic Science, Economics, Education, English, Fine Arts, Geography of Montana, Geology and Physiography, History, Home Decoration and Household Art, Library, Literature, Manual Training and Shop Work, Mathematics, Mechanical Drawing, Methods in Education, Modern Languages, Music, Physical Education, Physics, Playgrounds, Surveying. Over ninety courses are listed, but the University will not feel obliged to give any course in which four or more students are not enrolled.

Session of 1913:

The Summer School of 1913 will begin its session on Monday, June 9, and continue through Friday, July 18, a period of six weeks.

Registration:

As far as possible students should enroll at the office of the Registrar on Monday, June 9. Instruction begins at 8 a. m. the following day, Tuesday, June 10.

Admission:

There are no formal requirements for admission to the Summer School. Its courses are open to all persons qualified to pursue them to advantage.

Credits:

University credits toward degrees will be given only to those persons who present certificates and other credentials in satisfaction of regular requirements. A maximum of six semester credit hours may be obtained by a student who devotes his whole time to courses of University grade. Credit may be given at the rate of one semester hour for fifteen exercises, the courses meeting five periods per week having credit value of two semester hours.

Certificates:

Students of the Summer School who are not eligible to receive University credits will, upon request to the Registrar, receive certificates of attendance and of courses satisfactorily completed.

Expenses:

Registration—A general registration fee of $10.00 will be charged for any or all courses.

Room and Board—The University will undertake to provide accommodations (including room and board) at the rate of $30.00 for the six weeks' session, for all students who make application before May 21st, and who forward therewith a deposit of $5.00, and who pay the remaining $35.00 upon registering. At this rate, however, students should provide their own blankets, sheets and pillow cases. The dormitory on the campus will be reserved for women. For further particulars, address the Secretary of the University. Students who wish to secure accommodations in private families may do so, making their own arrangements. Rooms may be had for from $6.00 to $12.00 per month. Such persons may secure board at the University dining hall at the rate of $4.50 per week, or for $24.00 for six weeks, if paid in advance.

Travel—The authorities of the University wish to place the Summer School within the reach of all the teachers and students of Montana. In view of this, the cost of round trip railway fare (based on the cheapest route and not including meals or sleeper) less $5.00 will be refunded to those persons regularly enrolled. This privilege cannot be extended to persons living outside the state, who, however, may find it advantageous to buy tickets via Glacier Park or Yellowstone Park. Hence for Montana teachers and students it will be seen that the total expense of the Summer School need not exceed the following: Registration, $10.00; board and room for the session, $30.00; railway fare, $5.00. Total, $45.00, payable on registration.

Fees:

There are no tuition fees, except for private instruction in Music, for work in Household Art and Decoration and for students of the summer surveying camp who are not regularly registered in the School of Engineering. In the first a charge of $12.00 is made for two lessons a week during the session; in the second a charge fo $5.00 may be made for the course in drafting, draping and pattern-making; in the third a charge of $5.00 for the two-weeks' course will be made. Fees must be paid in advance upon enrolling at the office of the Registrar.

Laboratory Deposits:

Deposits to cover cost of materials furnished to students or of breakage, for which they may be responsible, will be required as follows:

Biological Station—Any course, $5.00.
Chemistry—For each course, $7.00.
Fine Arts—Course S2, $1.00; Course S3, $2.00.
Household Arts and Decoration, $5.00.

Manual Training—Courses S1 and S2, $1.00 per unit credit; Courses SIIa, and SIIb, $2.00 each.

Mechanical Drawing—Courses S1a, 50 cents; Course S1b, 75 cents.

Physics—Course SIb, $2.00; Course SC, $2.00.

Library:

The University Library will be open throughout the Summer school; full library privileges extended to Summer School students.

Recreation:

Social and recreational features will be made attractive. Receptions, informal dances, picnics, trout fishing, excursions up the mountains and to the Bitter Root and other points of interest, will be frequent. The gymnasium, tennis courts, ball field and track invite physical culture.

Lectures, Concerts:

A course of lectures of general interest, to be given at least once a week, will be arranged.

Professor Fischer has charge of weekly concerts, at which the best of music will be heard.

Reduced Railroad Rates—Important:

The State University is glad to be able to announce the arrangement of reduced round-trip rates of a fare and one-third from points in Montana for all who attend the Summer School of the University in Missoula.

Tickets will be on sale from June 3 to 10, inclusive, and the one-third rates for return will apply up to and including July 21.

Take receipts from agents for fares to Missoula. These receipts will entitle holder to the reduced rates when countersigned.

BIOLOGY.

(See the appended announcement of courses to be given at the Biological Station on Flathead Lake).

CHEMISTRY.

ACTING PROFESSOR W. G. BATEMAN.

S1. GENERAL CHEMISTRY—A study of the fundamental laws of chemistry and of the properties and the relations of the more common elements and their compounds. Text, Alexander Smith's Chemistry for Colleges. Prerequisite: High School Physics and Laboratory. Lectures daily.

Four semester credit hours.

S2. 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 of University Register.

Credit to be arranged.

S3. 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.

Credit to be arranged.

DOMESTIC SCIENCE AND HOUSEHOLD ART.

INSTRUCTORS TO BE APPOINTED AND COURSES TO BE ANNOUNCED LATER.

EDUCATION AND PSYCHOLOGY.

PROFESSOR W. W. KEMP, ASSISTANT PROFESSOR CHARLES H. WILLIAMS, SUPT. O. J. KERN; LECTURERS, HELEN HERON, IDA VANDERGAW, ALMA L BINZEL, CAROLYN E. MORRISON, SUPT. E. M. RAPP.

S1. GENERAL INTRODUCTION TO PSYCHOLOGY—A study of the facts and laws of consciousness and their relation to the body and nervous system. Special attention will be given to those chapters in Psychology which are fundamental for Education. Three lectures and two laboratory periods per week.

Two semester credit hours.

S2. EDUCATIONAL PSYCHOLOGY—The nature and extent of individual differences; biological and psychological aspects of learning and development; application of methods and results to the work of the school. This course applies on the University Certificate of Qualification to Teach. Five periods per week.

Two semester credit hours.

S3. HISTORY OF EDUCATION—The modern period. The evolution of educational ideals and the development of school systems in their relation to the history of civilization from the period of the Reformation to the present time, including the history of education in America. This course follows the course given in the Summer School of 1912 on the Ancient and Mediaeval periods. This course applies on the University Certificate of Qualification to Teach. Five periods per week.

Two semester credit hours.

S4. SCHOOL HYGIENE—Treats of the hygienic aspects of school architecture and equipment, the important principles involved in physical development, mental hygiene and hygiene of instruction, including such topics as tests of hearing, vision, fatigue, etc. This course applies on the University Certificate of Qualification to Teach. Five periods per week.

Two semester credit hours.

S5. EXCEPTIONAL CHILDREN—Education and examination of subnormal and supernormal children. Study of standard tests and their application to the classroom. Elimination, retardation, grading and promotion, special schools, individual versus class instruction. Two lectures and one laboratory period per week.

One semester credit hour.

S6. THE EDUCATION OF EARLY CHILDHOOD—The educableness of early childhood; some agencies for the education of the youngest children; the kindergarten, its nature and values; the kindergarten and the Montessori system; how the kindergarten prepares for primary reading. Five periods per week.

Two semester credit hours.

S7. PRIMARY METHODS FOR RURAL OR GENERAL PRIMARY TEACHERS—A practical study of the subjects taught in the first four grades from the standpoint of principles of method. The preparation of lesson plans and the question of how to best direct the instincts and self-activity of children in practical and formal instruction will receive consideration. The work will center about reading and story-telling with dramatic and manual activities for the concrete aspects. Five periods per week.

Two semester credit hours.

S8. THE FIRST AND SECOND GRADES—The message of the kindergarten to the primary teacher; Montessori's message; expressive activities; seat work; modern methods of teaching reading, language, penmanship, arithmetic, nature study and other subjects in the school curriculum. Five periods per week.

Two semester credit hours.

S9. THE TEACHING OF ORAL AND WRITTEN LANGUAGE—The development of the principles of composition; use of dramatization and other forms of reproduction; the use of pictures; the school paper, debates, etc. Five periods per week.

Two semester credit hours.

S10. THE INTERMEDIATE GRADES, (3, 4, 5, 6)—(a) Reading; means of securing rapidly and accurately the authors' thought; means of developing power in interpretation. (b) Arithemtic; means of securing insight into the fundamental operations, the basis of problem solving; means of securing accuracy and rapidity in the mechanical processes. (c) Penmanship; free arm movements versus finger movements. (d) Nature study; the school garden as a means of unification. (e) Geography; considered as a means of interpreting the child's environment. (f) Spelling; means of developing quick perception of word forms. (g) Language; oral and written composition. Five periods per week.

Two semester credit hours.

S11 and 12. GRAMMAR GRADE METHODS—A theoretical and practical discussion of the aims, subject matter and methods of instruction in the grammar grades, about as in Course S10. Lectures, assigned readings and discussions. To be divided into two courses. Five periods per week each.

Two semester credit hours each.

S13. TEACHING HOW TO STUDY—An application to the subjects of the school curriculum of the principles discussed in McMurray's How to Study and Strayer's The Teaching Process. Three periods per week.

One semester credit hour.

S14. ADMINISTRATION AND SUPERVISION OF SCHOOL SYSTEMS—A study of the practical problems in the organization and management of schools, courses of study, promotion, retardation, discipline, teachers' meetings. Problems of economy and efficiency in administration. The county superintendent in relation to the school system. Five periods per week.

Two semester credit hours.

S15. RECENT DEVELOPMENT OF RURAL EDUCATION—A study of the problems relating to rural schools. Three periods per week.

One semester credit hour.

ENGLISH AND LITERATURE.

PROFESSOR G. F. REYNOLDS, PROFESSOR FRANCES CORBIN, INSTRUCTOR G. M. PALMER.

Sa. CORRECT ENGLISH—Drill in spelling, punctuation, grammar and simple sentence structure. This course is advised for students intending to enter Freshman English who are at all deficient in these subjects, and for teachers desirous of obtaining new methods of presenting them. Students passing this course are excused from the preliminary Freshman examination in English.

No college credit. Mr. Palmer.

S1. ENGLISH COMPOSITION—Intensive study of a few works by contemporary writers and imitation of their prose in frequent themes with a view to securing a simple, clear, and attractive sentence structure. Open only to students with one year's college credit in English.

Two semester credit hours. Dr. Reynolds.

S2. HIGH SCHOOL ENGLISH FOR TEACHERS—Problems of High School English, both in composition and literature. A few typical classics will be used as the basis of this course.

Two semester credit hours. Mr. Palmer.

S3. AMERICAN LITERATURE—Lectures, discussions and required readings. This course may meet the needs of teachers

who wish to renew the subjects, or students may work for credit. Three recitations a week. Prof. Corbin.

S4. FICTION—The novel selections will be made from contemporary novelists, as Meredith, Herdy, James, Howells, Galsworthy. Two Recitations a week.

One-half of one semester credit hour. Prof. Corbin.

S5. ENGLISH POETRY—Victorian and contemporary poets. Five recitations a week.

Two semester credit hours. Prof. Corbin.

S6. THE ROMANTIC MOVEMENT—A lecture and reading course. A study of the pseudo-classical literature preceding the Romantic movement, with the principles of literary criticism held by the classicists; the origin of the Romantic movement, with a study of such early representatives of this movement as the Wartons, Young, Walpole, Thomson, Plake, Chatterton, Bickford, MacPherson, McCleod, and as much attention as it is possible to give to the later Romanticists of the nineteenth century. A study of the rise of Romanticism in France, with special emphasis on the influence of Rousseau, and a brief study of the beginnings of Romanticism in Germany, with a study of such representatives as the Schlegels, so far as possible.

Two semester credit hours. Mr. Palmer.

S7. TECHNIC OF DRAMA—Lectures on the drama with assigned readings of illustrative modern plays. This course will be of value as an introduction to the study of dramatic literature and as an assistance to teachers in the grades and high schools. If the class desires it several lectures will be devoted to the discussion of festivals and of high school plays. Open only to mature students. Five recitations a week.

Two semester credit hours. Dr. Reynolds. Students registering for this course should also take Course S8.

S8. MODERN ENGLISH DRAMA—Readings of representative English and American plays with brief introductory lectures. Monday, Wednesday, 2-4 p. m.

One semester credit hour. Dr. Reynolds.

FINE ARTS.

INSTRUCTOR TO BE APPOINTED.

S1. THE APPRECIATION OF ART—A course in the critical study of sculpture and painting, in which an appreciation of the aesthetic and tectural qualities of art are acquired.

Two semester credit hours.

S2. HOME DECORATION—An introductory course in home decoration, in which aesthetic principles are applied to the construction and embellishment of the home.

Two semester credit hours.

S3. ELEMENTARY DRAWING AND PAINTING—A course in free-hand drawing and painting and in methods of presenting the subject in the public schools.

One or two semester credit hours.

S4. PRACTICE IN DESIGN—The essential principles of design with applications in construction work especially adapted to the public schools.

S5. WATER COLOR PAINTING—A course in the handling of water colors, in which studies are made from still life and flowers.

One or two semester credit hours.

GEOLOGY.

PROFESSOR J. P. ROWE.

S1. PHYSIOGRAPHY—This course is intended for the teachers of the state, but college credit will be given for it. The work will be taken up according to Salisbury's Physiography, advanced course. Thirty lectures with twelve afternoons in the laboratory will be required to complete the course. The lectures will be largely illustrated with the lantern, stereoscopic views, and rocks and minerals from various localities. The material will be so selected that it will apply directly to illustrate the text. There will be three or four excursions to nearby deposits and rock formations, such as the volcanic ash beds near Missoula, the clay beds, Algonkian quartzite, shale and slate, and many other interesting points to illustrate the various topics in physiography. The laboratory work will consist of the study of typical minerals and rocks, together with charts, globes, topographic maps, and other material applying to the problems of the subject. The department of geology is well supplied with laboratory material, and the surrounding region is a most excellent place for field study. The entire subject of physiography will be covered, and it is expected that each student will spend at least from three to four hours per day in the study, lectures, and laboratory work upon this subject. If there are those who desire to take more work than is offered here, the head of the department will gladly outline a course of reading or laboratory work for such students.

S2. GEOLOGY—This course comprises thirty lectures and recitations and eighteen laboratory periods, together with numerous assigned readings. The text book used will be Chamberlin and Salisbury's College Geology. Nothing new need be said concerning the region surrounding Missoula as an interesting place to study geology. It is sufficient however to say that the Missoula valley shows coal and volcanic ash beds of the Neocene period, and the entire valley together with the Bitter Root valley shows splendidly the evidence of an old glacial lake bed. The coal beds, the ash deposits and the various glacial deposits of

the neighborhood will be visited and studied. In the laboratory there will be a general study of many minerals, rocks and fossils. This is intended primarily for those wishing to take a careful and systematic course in geology.

Two college credit hours will be given.

S3. MINERALOGY—This will be an elementary course in minerals, taking up the brief study of crystallography together with glass, wire and wooden models, showing the various forms and combination forms of crystals and the careful study of 150 minerals. They will be taken up more according to their physical properties than their chemical composition, but each mineral will be studied more or less from the three standpoints: Crystallographic, chemical and physical. There are a few splendid mineral deposits in the neighborhood and a trip or two will be made to nearby mines. This course is intended to give the student a fair idea of the chief characteristics of the most common minerals, many of which are found in the state of Montana. The department of geology has a splendid collection of minerals, and excellent specimens will be at hand for study in the laboratory. There will be thirty lectures and thirty laboratory periods. The prerequisite for this course is elementary chemistry and plane geometry.

Three semester credit hours.

S4. GEOGRAPHY AND GEOLOGY OF MONTANA—Lectures and field work. The object of this course is to give the student a general survey of the geological formation and products of the state, and a careful study of the geography. The mountains, rivers, valleys and their products will be studied, together with railroad maps, weather charts, rainfall charts, temperature charts, etc. Every student and teacher in the state should be more or less familiar with the geography and the general natural products of Montana. This course is intended to give a fairly careful study of these subjects. Three lectures and one laboratory or field afternoon per week.

One semester credit hour.

HISTORY AND ECONOMICS.

PROFESSOR J. H. UNDERWOOD, INSTRUCTOR DR. P. C. PHILLIPS.

S1. MEDIAEVAL HISTORY—A sketch of the history of Europe from the dissolution of the Roman Empire to the dawn of Renaissance. Especial attention will be given to mediaeval culture and institutions. Lectures, text and assigned readings.

Two semester credit hours.

S2. THE REFORMATION AND COUNTER REFORMATION—Causes of the reform movement; reform before the Reformation; principles of the Reformation; epoch of religious wars;

character of the period; results of the movement. Lectures, assigned readings, and reports.

Two semester credit hours.

S3. THE FRENCH REVOLUTION AND NAPOLEON—Causes of the Revolution; its character and principles; a study of the social, economic, and political ideas of the period. Lectures, readings, and reports.

Two semester credit hours.

S4. ENGLAND UNDER THE TUDORS—Lectures, assigned readings, and discussions.

Two semester credit hours.

S5. UNITED STATES HISTORY (1783-1830)—A course in political history. Lectures, text, and assigned readings.

Two semester credit hours.

S6. UNITED STATES HISTORY (1830-1876—The same as (5) above.

Two semester credit hours.

S7. TEACHERS' COURSE IN HISTORY—Lectures, assigned readings and discussions on the problems of history teaching in secondary and elementary schools.

Two semester credit hours.

S8. CIVIL GOVERNMENT—A general course for teachers reviewing the constitution and actual government fo the United States in its several departments with illustrations from current politics. The government of Montana will be studied from a syllabus with reference to the codes and session laws and departmental reports.

Two semseter credit hours.

S9. SOCIAL QUESTIONS—Selected topics in present day social problems and social reform movements.

Two semester credit hours.

S10. BUSINESS ORGANIZATION—A course in general business subjects; first, money and credit, various kinds of funds, business paper and business procedure; second, financial institutions, banks, savings banks, trust companies, Montana banks; third, the methods of organizing and financing corporations.

Two semester credit hours.

S11. GENERAL ECONOMICS.

Two semester credit hours.

LIBRARY.

LIBRARIAN BUCKHOUS.

The University Library with the aid of the Missoula Public Library will conduct a library institute for the benefit of those teachers who have, or may have, the care of high school or grade libraries.

The subjects taken up in this institute will include cataloging, classification, book ordering, mechanical processes of preparation, and charging systems. The work will require five afternoons, June 24th to 28th, inclusive.

MANUAL TRAINING, SHOP WORK AND MECHANICAL DRAWING.

PROFESSOR A. W. RICHTER, ASSISTANT PROFESSOR W. R. PLEW, INSTRUCTOR G. A. GROSS.

S1. MANUAL TRAINING. SHOP WORK—This course is arranged to meet the needs of teachers taking the course of lectures in manual training, given in the department of education. The work includes bench and lathe work in wood, pattern making, bench and lathe work in iron, etc.

Credit to be arranged.

S2. GENERAL SHOP WORK—Summer school students who do not wish to take a regular course, may take a special shop course. This will enable the student to take any work in which he may be especially interested.

Credit to be arranged.

SIIa. SHOP WORK—Work in carpentry, work turning and pattern making. This work is the same as that given during the first semester of the Freshman year. Students who wish to enter the Freshman class in engineering are advised to take this course in the summer school.

Two credit hours.

S IIb. SHOP WORK—Forge work, foundry, machine tool work. This work is the same as that given during the second semester of the Freshman year; the course is given to meet the needs of those who wish to take an engineering course.

Two semester credit hours.

S3. GENERAL COURSE IN MECHANICAL DRAWING—Teachers and other students who do not wish to take a regular course will receive work to meet their special needs and in which they are especially interested. Work will also be given to meet the needs of those attending the regular course in manual training.

Credit to be arranged.

S4. DESCRIPTIVE GEOMETRY—A course for teachers. Lectures and drawing, dealing with lines, planes, surfaces, tangents and intersections, shades and shadows and perspective. This course should be of special interest to those who wish to teach mathematics.

Two semester credit hours.

S Ia. MECHANICAL DRAWING—Freehand lettering, geometrical problems, construction of various curves, orthographic

projection and development of surfaces. This work is the same as the regular Freshman work given during the first semester. The course is intended for prospective engineering students.

Two semester credit hours.

S Ib. MECHANICAL DRAWING—Isometric drawing, machine drawing, working drawings followeing the practice of commercial drafting rooms. Prerequisite: Drawing Ia.

Two semester credit hours.

S5. SURVEYING—A general course in surveying will be offered to meet the needs of surveyors, mechanical and electrical engineering students and others. The Course is also open to teachers who wish to have a general knowldge of surveying. The field work includes the use and adjustment of the level and transit, with solar attachment; taping, leveling. Surveying with transit and tape. The work at the University will be preceded by two weeks' work in Summer Camp at Flathead Lake. Ten hours of surveying work in the field will be required of students during the time of the summer camp. This will be followed by class room and field work instruction given at the university. The work at the university will require two afternoons each week. During the summer camp board will be furnished at cost.

Two semester credit hours.

MATHEMATICS.

PROFESSOR L. C. PLANT, INSTRUCTOR E. F. A. CAREY.

S1. ELEMENTARY ALGEBRA—Three or five periods per week.

S2. PLANE GEOMETRY—Five periods per week.

S3. SOLID GEOMETRY—Five periods per week.

S4. PROPERTIES OF NUMERICAL NUMBERS—Three or five periods per week.

N. B.—The above named courses will be given primarily to meet the needs of those teachers desiring to obtain first grade or professional certificates.

S5. COLLEGE ALGEBRA——This course aims to give a clearer insight into academic mathematics as well as to lay the foundation for more advanced work. Prerequisite: Elementary algebra and plane geometry.

Two semester credit hours.

S6. ELEMENTARY ANALYSIS—This course is designed for teachers of mathematics in the high school who wish to broaden their knowledge of the subject.

Two semester credit hours.

S7. TEACHERS COURSE—A critical review of secondary mathematics; discussion of current developments in methods of teaching and subject matter taught; comparative study of lead-

ing textbooks; correlation of mathematics with allied subjects; laboratory mathematics.

Two semester credit hours.

S8. CALCULUS.

Credit to be arranged.

S9. DIFFERENTIAL EQUATIONS.

Credit to be arranged.

S10. ANALYTIC MECHANICS.

Credit to be arranged.

N. B.—Courses 8, 9, and 10 cover the subjects usually given in the second and third years of college.

For those who wish to do work toward a higher degree the department will arrange to offer the following additional courses:

SYNTHETIC PROJECTIVE GEOMETRY; ADVANCED CALCULUS; THEORY OF NUMBERS; FUNCTIONS OF A COMPLEX VARIABLE.

MODERN LANGUAGES.

PROFESSOR F. C. SCHEUCH.

German.

S1. ELEMENTARY—Two periods per day.

Four semester credit hours.

S3. INTERMEDIATE OR ADVANCED—One period per day.

For students who have completed the grammar and who wish to do some higher reading and composition work.

Two semester credit hours.

French.

S1. ELEMENTARY—Two periods per day.

Four semester credit hours.

S3. INTERMEDIATE OR ADVANCED—One period per day.

For students who wish to register for intermediate readings or advanced readings. Texts will depend upon the preparation each person may have had.

Two semester credit hours.

Spanish.

S1. If a sufficient number of students apply, work in Spanish will be given, depending upon preparation and number of hours given to the subject.

Amount of credits to be arranged after enrollment in the course.

MUSIC.

PROFESSOR GUSTAV L. FISCHER.

S1. PIANO—Private instruction, adapted to the needs of each

student. Lessons during the Summer School. Time and terms to be arranged.

S2. VIOLIN—Private instruction, adapted to the needs of each student. Lessons during the Summer School. Time and terms to be arranged.

MUSIC RECITALS—Weekly recitals will be arranged by the department. Programs and times will be announced later.

PHYSICS.

ASSISTANT PROFESSOR R. N. THOMPSON.

The following schedule of courses is a tentative scheme, arranged to meet primarily the needs of teachers. It is hoped that it may stimulate the summer students to plan a continuous course in physics summer after summer. For this reason course I (a) and I (b) will be offered in 1913 and course II (a) and II (b), which follow naturally, next summer, provided of course, that there is sufficient demand for them. These courses are the equivalent to the first year of college physics.

Prospective university students may satisfy the entrance requirements in physics by taking courses SA, SB and SC.

SA. ELEMENTARY PHYSICS—This course will cover the subjects of properties of matter, mechanics and heat. No credit will be given for this course until courses SB and SC are taken. These three courses are the equivalent of a standard high school course in physics and credit for them will entitle the candidate to one unit of entrance credit, where such credit is desired.

Lectures M. T. W. Th. F.

SB. ELEMENTARY PHYSICS—This course is a continuation of SA and will cover the subjects of electricity, magnetism, sound, light and radiation phenomena.

Lectures M. T. W. Th. F.

SB. LABORATORY OF ELEMENTARY PHYSICS—This course will include forty-five or fifty laboratory problems of elementary physics and will constitute the laboratory work of courses A and B.

Laboratory M. T. W. Th. F. S.

SI (a). MECHANICS, MOLECULAR PHYSICS AND HEAT—This course comprises the lectures and recitations of course I in college physics. The same subjects will be taken up and treated with the same thoroughness as in our regular work.

Lectures M. T. W. Th. F. Two semester credit hours.

To be given in 1913, if there is sufficient demand.

SI (b). MECHANICS, MOLECULAR, PHYSICS AND HEAT—(Laboratory). This is the laboratory course corresponding to I (a) and when satisfactorily completed it will entitle the student to credit for course I in college physics.

Laboratory M. T. W. Th. F. S. Two semester credit hours.
To be given in 1913 if there is sufficient demand.

SII (a). ELECTRICITY, SOUND AND LIGHT—(Lectures). This is a course in subjects similar to I (a).

Lectures M. T. W. Th. F. Two semester credit hours.
To be given summer, 1914, not given summer, 1913.

SII (b). ELECTRICITY, SOUND AND LIGHT—(Laboratory.) This course is similar to I (b).

Laboratory M. T. W. Th. F. S. Two semester credit hours.
To be given in 1914, not given in 1913.

SIII. MODERN ELECTRICAL THEORY—This course will briefly review the more important phases of recent development of electrical theory and its relation to the constitution of matter. University credit will be allowed only to students who have had a course in college physics but may be attended by anyone.

Lectures M. W. F. One semester credit hour.

PHYSICAL EDUCATION.

DIRECTOR OF PHYSICAL EDUCATION, W. W. H. MUSTAINE. INSTRUCTOR TO BE APPOINTED.

There is a growing demand by school boards for teachers who understand something of the principles underlying physical education and who have a teaching knowledge of scientific exercises adaptable to schoolroom and playground use. Frequently teachers who have some familiarity with this subject have been given preference over those who have not. Progressvie schools are rapidly including physical training among the required subjects and the regular teachers are expected to teach it. Lack of interest upon the part of the teacher, which usually means lack of everything but the most general knowledge of the subject, too often causes this important work to be a perfunctory performance, dull and uninteresting, when it should be attractive and productive of splendid educational results.

Many high school teachers are expected to conduct physical training in addition to the teaching of other subjects. Many doubtless realize their need of better preparation, but have no time for this except during the summer months.

There seems to be a demand for male teachers who are qualified to supervise the athletic activities of the boys and to coach them in the various athletic sports. A course in athletics will be offered if a sufficient number desire to register for this class.

Classes for men and women will be organized separately for practical floor work. Men will be expected to wear rubber-soled shoes, full length trousers, and athletic shirt, and women will provide themselves with rubber-soled (or light leather-soled) shoes, divided skirt and blouse.

Through the following courses the university offers the oppor-

tunity to all persons to become more conversant with this subject during the Summer School:

S1. (a) Theory of physical education, two hours a week.

(b) Schoolroom exercises, with special reference to the effects of specific exercises on posture. Three hours a week.

(Course I should be of value to teachers of all grades in the elementary and high schools).

S2. Practical floor work, including Swedish gymnastics without apparatus and German gymnastics with light apparatus. These exercises will be selected for their general value. Five hours a week.

(Course S2 should appeal to all teachers and others who feel the need of exercise. This work daily for six weeks should accomplish great results).

S3. (a) Theory of play and school playgrounds. Two hours a week.

(b) Playground games and folk dancing. Three hours a week.

(Course S3 should attract all teachers whose duty it is to lead the children's games on the playground or in the gymnasium).

S4. Municipal playgrounds and the playground movement in America. Theory and practice. Five hours a week.

(This course will include playground location, equipment, arrangement, policy, organization, administration, and control. There will be opportunity for observation and practice on the local playgrounds. It is designed to give practical instruction to those who wish to supplement their regular school work with playground work during the summer vacation).

BIOLOGICAL STATION

OUTLINE FOR SEASON 1913.

A Station for instruction and research in Biology will be maintained by the University of Montana for the eleventh season, as a part of its regular summer session, during the six weeks from June 17th to July 30th. Students may stay as much later as they desire.

LOCATION.

The Station is located at Yellow Bay on Flathead Lake, which is about midway on the eastern shore. At this place, the University owns eighty-seven acres, with nearly a mile and a half of shore line, given by act of congress. The station building is about a mile and a half from the post office Glen. The distance from Somers, the terminus of the Great Northern railroad, is about twenty miles; from Bigfork at the upper end of the lake on the mouth of Swan River, seventeen miles; and from Polson, on the lower end of the lake, about sixteen miles. Connection is made from these places by boat. An automobile road is under construction along the east lake shore, and has been completed from the north end almost to the Station grounds.

The region is a virgin forest. The Mission mountains rise abruptly from Flathead Lake on the east, reaching an elevation of almost 8,500 feet near the station, or a mile in verticle distance above the water. These mountains present a variety of collecting fields, from the dense woods at the lake to alpine vegetation and talus meadows. A trail has been blazed to one of the summits. By boat, it is possible to reach in a short time the swampy delta of Flathead River, where it enters the lake, the swamp at the southern end of the lake, prairie country in several locations, and numerous islands. The lake itself covers more than three hundred and fifty square miles and is three hundred feet deep.

The beach at the Station is fine gravel or sand. There is no dust at any time. The bay is a perfect harbor for boats, making a pleasant patime of rowing. The beach is excellent for bathing.

Besides this tract the Station has two other sites of forty acres each, one on Idlewilde Island, the other on Wild Horse Island. Both of these are used during the summer.

The topography near the Station is such as to afford a variety of floral and faunal conditions. From the deep lake to high mountain top is an extreme which few places can present. From virgin prairie to virgin forest the distance is but a few miles. Rock cliffs and talus slopes and large swamps present marked contrasts for study and collecting. In these places are many rare forms of animal and vegetable life. Bear, deer,

even moose, have been seen close to the Station, as have the puma, lynx and other small animals. In such rich fields there is much pioneer work yet to be done.

BUILDINGS AND EQUIPMENT.

The Station building is a two-story brick structure, thirty by forty feet, with a cement floor below and rooms for investigators and others on the second floor. It is situated in a beautiful grove of native yellow pine and tammarack several hundred years old, is above high water mark, and commands a magnificent view in every direction. A mountain stream furnishes an abundance of pure and ice cold water. There is a dark room for photography. A big fireplace makes the place cheerful on cool evenings.

The Station has a boat thirty feet long and seven feet beam, with a twelve horse power gasoline engine. It is capable of carrying fifteen people. There is a second smaller boat, sixteen feet long, with gasoline engine, a row boat and two canvas boats. There is the usual collecting apparatus of various kinds. The fees mentioned later cover all expenses connected with the use of the boats and material.

PLAN OF WORK.

It is not the purpose of the Station to duplicate the work offered at the University, but to provide facilities for field work of a kind that cannot be well carried on with limited hours for a schedule. Each person may select the study he wishes to pursue, and give to it all or a portion of his time. Instruction will be limited to certain courses for beginners, but qualified students may elect special work and pursue any line of investigation or study they desire. Provision will be made for both elementary and advanced study in botany and zoology in its various fields. Credit for equivalent university work will be given to those requesting it to the amount of six hours. This requires full work for the entire six weeks.

REGISTRATION.

The number to be accommodated is limited. Hence immediate registration is necessary to insure admission and accommodations. There is a limited number of tents. There are no boarding places near. It is impossible to supply and equip a large number of tents, for it is impossible to anticipate the attendance. Applications should be addressed to the Director of the Biological Station, University of Montana, and should indicate the courses the student intends to pursue, his preparation for them, and whether he will bring his own camp equipment or use that provided by the station.

FEES AND EXPENSES.

Students will pay the regular Summer Session fee of twelve dollars for the six weeks, and will be entitled to take courses aggregating six hours' University credit. If students wish to stay later and use the buildings and material for further study, they may do so without further pay. A charge of five dollars is made for the use of the scientific equipment and the boats. A further charge of five dollars is made to each person occupying a tent. This charge is not increased, no matter how long the person may stay. Students may, however, provide their own camp equipment of such sort as they may choose. Board at the Camp Mess Tent is provided at cost, which will be about six dollars per week.

STAFF OF INSTRUCTION.

MORTON J. ELROD.

Professor of Zoology in the University of Montana, Director of of the Biological Station.

J. E. KIRKWOOD.

Professor of Botany and Forestry, University of Montana.

CHARLES C. ADAMS.

Associate Professor Animal Ecology, Universtiy of Illinois.

PERLEY M. SILLOWAY.

Principal Varden High School, Virden, Illinois.

COURSES.

ELEMENTARY ZOOLOGY—A course of lectures, accompanied by suitable laboratory exercises and field work intended to meet the needs of students who have had no previous training in Zoology.

GENERAL ECOLOGY—A study of the animals found in the region including their collection, classification, distribution and habits. Field work with lectures and photographic records of ecological phenomena.

ORNITHOLOGY—A study of the birds of the region, their classification, modes of identification, nesting habits, songs, distribution ,with methods of making and preserving skins for future study.

ENTOMOLOGY—By lectures, book references and field work a fairly comprehensive study of the insects will be given, including representatives of the various orders. Attention will be given to forest insects.

PLANKTON—In this course will be given a systematic and ecological study of the organisms of Flathead Lake.

RESEARCH—Advanced students wishing to engage in research work in botany or zoology will be given problems for investigation to be conducted under the direction of the several members of the staff.

NATURE STUDY—While no definite courses will be outlined, those desiring it, will be given help and instruction in collecting and preparng material for use in any grade of work and will be given methods of study in connection with such material.

PHOTOGRAPHY—Those desiring help will be given instruction in the use of both plates and films, in exposing, developing and printing. Those who know little of the subject and those who may be more proficient will alike profit from the experience and help at their disposal. It is expected that students will furnish their own cameras, with plates or films and paper.

PHYSIOGRAPHY—High School teachers and pupils, and others will be aided in methods of study of the earth's surface by lectures and field work. Mountain formation and erosion, glacial action, river deposit, lake beaches, stream erosion, the causes producing forest and prairie, and many other phenomena, may be illustrated and studied in the region about the station.

ELEMENTARY BOTANY—An introduction to the study of plants, presented by lectures and field work adapted to the needs of students who have had no previous training and who wish to pursue the study for its own sake or for credit.

FORESTRY—This will include the identification of trees and shrubs, a study of the forest floor in its various aspects, distribution with respect to both moisture and altitude, the succession of timber growths, parasitic and other forest enemies, and the like, from lectures and field work.

EXCURSIONS.

Frequent excursions to various parts of the lake, and to the mountains will be made. Such trips will be to points of scientific and scenic interest, which are abundant. Excursions to nearby places by boat or on foot will be of almost daily occurence. Camping trips will be arranged during which informal instruction in camping and woodcraft will be given.

LECTURES.

In addition to the lectures to be given in connection with the various courses popular evening lectures will be presented in the laboratory for all who are present. There will be two or more each week, given by members of the staff and others who may be invited. These lectures have in the past been very popular. Some of them have been published in a bulletin.

RECREATION.

It is possible to do full work in hours, sleep all the time that is needed, and still have an abundance of time for recreation. But recreation will not be permitted to interfere with the regular work to be done. Boating, fishing, swimming, forest rambling, and mountain climbnig may be indulged in to the heart's content. The location of the Station is in the midst of a mountain and forest wilderness, extending for miles. It is possible to combine with study, the pleasure of a summer outing, which will invigorate the jaded teacher, student or others of sedentary occupation, and return them to work in the fall with renewed vigor, a stock of rich experience and a wealth of information which money cannot buy and which no one can take away. Many testimonials could be given of the great gain in health, knowledge and practical experience from such a summer, as much as is possible in regular university attendance.

CERTIFIED PUBLIC ACCOUNTANCY

Chapter 39 of the Session Laws of 1909 provided for the regulation of the practice of public accounting in Montana. The State University administers this law and issues certificates of competency to any person who:

(1) Is a citizen of the United States or who has in good faith and in the manner required by law declared his intention of so becoming;

(2) Is of the age of 21 years;

(3) Is of good moral character;

(4) Is a graduate of an accredited High School or has had an equivalent education;

(5) Has had three years' practical experience in accounting acquired in practice on his own account, or in the office of a public accountant, or in a responsible accounting position in the employ of a business corporation, firm or individual;

(6) Has successfully passed certain written and oral examinations prescribed by the law, or

(7) Is exempt under the section of the law applicable to persons having certificates of other states or countries, or under the temporary provision for the exemption of experienced accountants already practicing in the state; and

(8) Has paid in advance the fee of twenty-five dollars, as prescribed by the law.

The above mentioned examinations are held at least once each year in December, or semi-annually in June and December, 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.

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 hand writing 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 ($25.00) dollars, 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 ($25.00) dollars 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 Registrar 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 H. W. Ballantine, and Registrar J. D. Dunlop.

(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: J. C. Phillips, W. D. Mangam, 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 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 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 Accountant" in another state extending like privilege to this state; provided, that in the opinion of the Board of Examiners the requirements for such certificate are equivalent to the requirements in this state.

Second, those holding similar certificates of another country, the requirements for which are equivalent to those in this state; provided, that the applicant is either a citizen or has declared his intention to become such.

Third, persons of at least twenty-five years of age, whose qualifications were equal to those prescribed for applicants for examination, who were known to the Board of Examiners as competent and skilled accountants; provided, they applied for certificates within one hundred and eighty days after the passage of the act.

Applicants under any of these provisions may obtain blanks from the University or the Board of Examiners and must pay the fee of twenty-five dollars as prescribed. These applications will be acted upon in the same manner as those for examination.

DEGREES CONFERRED—JUNE, 1912

Baker, Leo Walter.....B. S. in Engineering.
Conner, Daniel Marion.....B. S. in Engineering.
DeRyke, Florence .....B. A. (Literature)
Forbis, Clarence Jenks.....B. S. (Biology)
Fredell, Ernest W. .....B. S. in Engineering.
Gough, Nina Pearl .....B. A. (Modern Languages)
Hubert, Ernest E. .....B. S. (Forestry)
Hunter, Birdie Florence .....B. A. (Mathematics)
Irwin, Bessie .....B. S. (Botany)
Johnson, Sarah Maude .....B. A. (History and Economics)
Leech, Florence .....B. A. (Modern Languages)
Maclay, Holmes .....B. S. (Geology)
McCullough, Maude Brooks.....B. A. (Modern Languages)
Mason, Milton .....B. S. in Engineering.
O'Rourke, Arthur William.....B. A. (Economics)
Rankin, Grace Evelyn .....B. A. (History and Economics)
Richards, David Dudley .....B. S. (Geology)
Robertson, Annabelle .....B. A. (Latin and Greek)
Ryan, William Emmett .....B. S. (Geology)
Savage, Azelie Agnes .....B. A. (Modern Languages)
Shunk, Shirlie Belle .....B. A. (History and Economics)
Sleeman, Florence .....B. A. (History and Economics)
Thieme, Fred E. .....B. S. in Engineering.
Van Engelen, Beulah .....B. A. (Literature)
Warren, DeWitt Cregier .....B. A. (History and Economics)
Wear, Helen .....B. A. (Latin and Greek)
Wharton, Carolina Pack .....B. S. (Biology)
Whipple, Gertrude A. .....B. A. (Modern Languages)
Winstanley, Edward Alexander....B. S. (Geology)

REGISTER OF STUDENTS, 1912-13

Enrolled in Regular Courses.

Note—Choice of major department is made at the beginning of the Junior year, except in technical departments. Credit hours are stated as completed by February 1. 1912.

Name—	Credits	Major	Address
Ade, Harry George	29		Deer Lodge
Allen, Edward	39		Lolo
Allison, Herman Thomas	105	Mathematics	Missoula
Anderson, William Herbert	29		Missoula
Anderson, William Mathew	15	Law, 1st Yr.	Sand Coulee
Armitage, George Thomas	73½	English	Billings
Baird, Alva Clarence	15½		Stevensville
Baker, Mary Gertrude	16½		Stevensville
Bauer, Charles Edgar Melvin	14½		McAllister
Baxter, Galen Otis	43½		Two Dot
Beck, Anna Marie	16½		Deer Lodge
Birdsall, Frances Barbara	14½		Missoula
Birely, Esther Mae	75½		Billings
Bischoff, Paul A.	11½		Oberlin, Ohio
Boddy, Elias Manchester	0	Law, First Year, Special	Thomas, Wash.
Boldt, Helene Bertha	45½		Ruthton, Minn.
Bonner, Marguerite Marie	35½		Missoula
Borland, Robert Stuart	28		Mercer, Pa.
Bowman, Leroy Jay	52	Engineering	Terre Haute,Ind.
Branger, Dave Nicholas	13½	Engineering	Billings
Brown, James Arthur Murray		Law, First Year, Special	Philipsburg
Buse, Alpha Beatrice	17½		Polson
Busha, Charles Thomas, Jr.	14½		Big Timber
Cain, Warren Oliver	8		Missoula
Cameron, Carl Ernest	104	Economics	Missoula
Carney, Mary Florence	15½		Springdale
Carpino, Frank	40½	Engineering	Butte
Chadwick, Edna Ruth	15		Missoula
Clarke, Jeanette Osborne	15		Blilings
Clements, Colin Campbell	13		Marmath, N. D.

Name—	Credits	Major	Address
Conway, Walter Lincoln	41½		Dillon
Craighead, Barclay	6½		Missoula
Craighead, Edwin Boone, Jr.	66	Law, First Year	Missoula
Cronk, Ruth Elizabeth	43		Townsend
Cummins, Edwin John	14½		Missoula
Curran, Francis Ralph	13½	Engineering	Butte
Daems, Leonard Ray	8½		Virginia City
Darrow, Lyle Russell	16	Engineering, Special	Lewistown
Davidson, Bertram	0		Lancaster, Pa.
Davis, Anna Evelyn	58½	Literature	Missoula
Davis, Dorothea C.	0		Missoula
Davis, Horace Summer	75½	Economics and History	Missoula
Day, Clifford Olen	70½	Engineering	Missoula
Dehler, Rudolph Walter	15½	Engineering	Helena
Dehnert, Avory Willis	16	Engineering	Moore
Dehnert, Francis Earl	16	Engineering	Moore
Dennis, Eunice Louise	15		Missoula
Deschamps, Elzeard	11	Law, First Year, Special	Missoula
Dickey, Carl Chandlee	74½	Economics and History	Belt
Dobson, Cecil Frank	121	Engineering	Missoula
Dornblaser, Paul Logan	76	Law, Sec. Year, Special	Chicago, Ill.
Dowd, Earl C.	0		Victor
Duncan, Stella Louise, B. A.	Gr.	Modern Languages	Whitefish
Evans, Beverly Price	18½	Engineering	Missoula
Evans, Pansy Alice	9		Missoula
Faust, Hilda	16		Missoula
Finley, Catherine	75	Biology	Missoula
Forbes, Lucius Elder	41		Helena
Foss, George H.	13½	Engineering	Mullan, Ida.
Freeze, Gladys Julia	115	History	Missoula
Friday, Richard C. W.	31	Law, First Year	Missoula
Garlington, Mable Alma	108	Modern Languages	Missoula
Garrigus, Frank Frances	11½		Billings

Name—	Credits	Major	Address
Gault, Frank Presbay	13½		Great Falls
Gervais, Paul Leon	71½	Geology	Butte
Gilbert, Isabel Alice	15½		Butte
Gilchrist, Raleigh	43½		Great Falls
Gilliland, Gussie Dell	46		Kalispell
Gilliland, Ross	0	Engineering	Kalispell
Glick, Carl Cannon	71	English	Hamilton
Griffith, William	10½		Anaconda
Gross, Gustav Adolph	28	Engineering	Missoula
Gwinn, Hubert Huxley	46½	Engineering	Missoula
Hansen, Peter Emil	75	English	Missoula
Hardenburgh, Alice	76½	Biology	Missoula
Harmon, Cora Alice	50		Helena
Hart, Harriet, B. A. (University of Nebraska)	Gr.	Geology	Missoula
Hart, Letitia Candace	35		Missoula
Hawk, Hazel	47½		Missoula
Heyward, Gladys Loie	108	Literature	Hamilton
Higgins, James Harris	14½		Hamilton
Hoblitt, Alvin Bailey	60	Law, Sec. Year, Special	Missoula
Hoel, Archie Bernard	45½		Menomonie, Wis.
Huffman, Gladys Marguerite	105	Modern Languages	Butte
Humphrey, Clyde P.	0		Wallace, Ida.
Hunt, Josephine Marie	32		Kalispell
Hunt, Lewis Whitehead	41		Kalispell
Hutchinson, Anne Elizabeth	107	Physics	East Helena
Ingalls, Mildred Franklyn	111	Modern Languages	Missoula
Jackson, Clifton Samuel	82	History	Victor
Jacobson, Ruby I. S.	32½		Missoula
Jahr, Elmer M.	14½		Helena
Janeck, Francis E.	3½		North Yakima, Wash.
Janeck, Victor Walter	11½		North Yakima, Wash.
Johnson, Cecile C.	45		Missoula
Kain, Elsie Maude	16½		Stevensville
Kees, Arline	0		Walla Walla, Wash.
Kelly, Edward Patrick, B. S. (Dartmouth)	Gr.	Law, Sec. Year	Big Timber

Name—	Credits	Major	Address
Kellogg, Grace Lucile	10		Detroit, Mich.
Kennedy, Ruth Mildred	47		Butte
Kettlewell, Katherine Merle	46½		Missoula
Klebe, George Lester	63	Engineering	Fort Missoula
Kramer, Cecil Inice	126½	Engineering	Missoula
Kuphal, Hubert Hugh	70	Engineering	Missoula
Lansing, Harold H.	15½	Mathematics	Missoula
Leary, Grace Marie	39½		Libby
Lebkicher, Marie	36		Missoula
Leopold, Rose	117½	Modern Languages	Helena
Lewis, Gladine	112	English	Howard
Little, Nathaniel Stanton, Jr.	70½	Englsih	Missoula
Logan, Lelia Margaret	12		Anaconda
Long, Wliliam George	16½		Stevensville
Ludden, Mary Constance	0		Great Falls
Lyden, Mabel Mary	85½	Mathematics	Butte
McCall, Donna Letitia	13½		Big Timber
McCarthy, Gladys Elizabeth	15½		Townsend
McCarthy, Patrick Thomas	73		Anaconda
McDonald, Erma Corinne	15		Missoula
McFarlane, Cornelia Gertrude	104	Modern Languages	Winnifred, Alberta
McGuire, Mary Kathleen	42		Hamilton
McJilton, Mamie E.	38		Philipsburg
McLaughlin, Winifred Beatrice	31		Missoula
McManus, Joseph	15½		Anaconda
McPhail, Walter Neil	11½		Drummond
Maclay, Helen Elizabeth	13½		Lolo
Marsh, Hilda Frances	49½		Missoula
Mathews, Florence May	104	Literature	Missoula
Mathewson, Grace	16½		Anaconda
Mathewson, Alice Seabury	123½	Mathematics	Anaconda
Menich, Ivan Edward	0	Law, First Year, Special	Timber Lake, S. D.
Merrifield, Edith Lucile	45½		Union Pier, Mich.
Metcalf, Helen Frances	106	History	Stevensville
Metlen, Bruce Joe	12½		Armstead
Metlen, Genevieve E.	15½		Armstead
Miller, R. Justin, A. B. (Leland Stanford, Jr.)	Gr.	Law, Third Year	Hanford, Cal.

Name—	Credits	Major	Address
Molchior, Claude William	12½		Missoula
Molchior, Herbert Bismark	12½		Missoula
Montgomery, Jay Gordon	46½	Engineering	Chinook
Moreton, William M.	11		St. Anthony, Ida.
Murray, Irene Trenre	17		Missoula
Neff, Charles Melvin, LL.B.	Gr.		
Nesbit, Millard Francis	26½		Pray
Newell, Beach	0		Boston, Mass.
Nicholson, Stuart H.	65	Botany and Forestry	Big Timber
Nutting, Ruth Amelia	18		Laurel
Oneal, Mrs. Glen	113		Wisdom
Oneal, Glen	11½	Engineering	Wisdom
O'Rourke, Arthur William, B. A.	Gr.	Law, Sec. Year	Helena
Orr, Helen Anna	17		Missoula
Owsley, Merritt Miner	46½		Twin Bridges
Peppard, Obert Alfred	19		Missoula
Phillips, Mrs. Paul C.	31		Missoula
Pinckney, Frank Alfred	2		Three Forks, B. C.
Powell, Gregory Samuel	13		Ballantine
Pride, Vera Lucile	26		Hamilton
Rask, Olaf Selmer	47½		Kalispell
Read, Effie	8		Hamilton
Rhoades, Bess Ann	62	Literature	Missoula
Richter, Florence Marion	16½		Manitowoc, Wis.
Richter, Frederick August	80½	Engineering	Missoula
Robinson, Clara Marie	14½		Butte
Roberts, Lloyd Southwick	14½		Hamilton
Rolfe, M. Edith, B. A.	Gr.	History and Economics	Missoula
Rolfe, Hester Edgerton	0	Library Apprentice	Missoula
Ronan, Peter	68½	Geology	Missoula
Rosenburg, George	2		Wilson Creek, Wash.
Rowley, Lancelot C.	15½		Lewistown
Saner, Grace Yates	60	English	Butte
Schilling, Cora Evelyn	48½		Missoula
Schopper, John	15½		Eudora, Kan.
Schroeder, John M.	15		Livingston

Name—	Credits	Major	Address
Schug, Harry Penman	14½		Columbus
Scrogin, Lillian	13½		Big Timber
Selfridge, Bernice	59		Butte
Sestak, Bessie	16½		Victor
Sestak, Rose	16½		Victor
Sewell, Harry Fisher	50		Philipsburg
Sharp, Mary Cecil	6½		Stevensville
Shaw, Lester A.	2		Westfield, N. Y.
Shea, James Joseph	22½		Stevensville
Sheedy, John William	65		Missoula
Shull, Florence Josephine	49½		Missoula
Shull, Mary Patience	115½	Botany	Missoula
Simon, Dorothy Janet	14½		Butte
Simpkins, Glaude G.	16½		Missoula
Sinclair, Edna Louise	50½		Helena
Sloan, Royal Daniel	114	Engineering	Missoula
Smead, William Burton	27	Engineering	Missoula
Smith, Ellsworth G.	45	Law, Sec. Year	Missoula
Smith, La Rue	75	Law, Sec. Year, Special	Helena
Smith, Louise Elizabeth	110	Modern Languages	Willmette, Ill.
Sorenson, Charles C.	11	Law, First Year, Special	Brainard, Minn.
Speer, Earl LeRoy	98½	Law, First Year	Elkhart, Ind.
Stabern, Suzanne	110	Mathematics	Helena
Stagg, Ira	7		Anaconda
Stanley, Edwin J.	44½		Whitehall
Stephenson, Evelyn Miller	53		Florence
Stone, George Putman	72	English	Missoula
Stever, William John	50	Law, Sec. Year, Special	Missoula
Streit, Norman Church	14		Missoula
Sutherlin, Kathryn Janie	14½		Great Falls
Tabor, Henry Whitney	15½		St. Ignatius
Taylor, Emma Gertrude	34		Missoula
Taylor, Nicholas Joachim	46½		Missoula
Teagarden, Irene	48½		Missoula

Name—	Credits	Major	Address
Templeton, William Payne	12½		Missoula
Thomas, Roy E.	17½		Butte
Thomson, Bruce McKay	36½		Billings
Thompson, Oscar James	0	Law, Third Year, Special	Fairmont, N. D.
Thurston, Arthur Eugene	15½	Engineering	Moore
Tope, Joseph Clarence	45		Fort Benton
Uline, Augusta Diana	26½		Dell Rapids, S. D.
Warren, DeWitt, Cregier	Gr.	Law, Sec. Year	Missoula
Watkins, Gordon	68		Joliet, Ill.
Wells, Roscoe W.	98	Economics	Fridley
Wenzel, Harry Edwin	15½		North Fon du Lac, Wis.
Whisler, Fred Herbert	67½	Engineering	Missoula
Whiting, June Rose	80	Literature	Missoula
Wiedman, Raymond Henry	54	Law, Sec. Year, Special	Pony
Wilde, Bessie May	74½	Modern Languages	Missoula
Wilson, Irma	16½		Hamilton
Wilson, Roy Arthur	35		Mullan, Ida.
Wilson, Walter Gordon	12		Boulder
Wolfe, Kenneth	36		Butte
Woody, Franklin Hayes	6		Missoula
Worden, Donovan	75	Law, First Year	Missoula
Wright, Arthur William	10		Hinsdale
Wright Lulu Jane Louisa	17		Missoula
Young, Donald Bruce	42½		Kalispell
Zerr, Gertrude Arden	45½		Fort Madison, Ia.

SHORT COURSE FORESTRY STUDENTS

Baum, Arthur Mason . . . . . Red Lodge, Mont.
Dowd, Earl Clifford . . . . . Victor, Mont.
Emswiler, Samuel J. . . . . Ekaloha, Mont.
Ferris, Rolland Cecil . . . . . Chouteau, Mont.
Goodale, Harry Appleton . . . . . Wilber, Mich.
Grigg, George . . . . . Stearns, Mont.
Hankinson, George H. . . . . Quartz, Mont.
Hart, A. Wellington . . . Cowley, Alberta, Canada
Knowles, Percy . . . . . Stevensville, Mont.
McGill, David F. . . . . Cox, S. D.

Perry, George A.	Red Lodge, Mont.
Thorsell, Victor Emmanuel	Maxville, Mont.
Wight, C. H.	White Sulphur Springs, Mont.
Young, Winthrop Hays	Stevensville, Mont.

SUMMER SCHOOL STUDENTS, 1912.

Allaway, Lizzie	Missoula
Akin, Henri Etta	Missoula
Anderson, William Herbert	Victor
Baumert, Clara Ethel	Big Arm
Baumert, Ida Estella	Big Arm
Bauch, Amelia Justina	Missoula
Barnes, Retta	Missoula
Beckwith, Lawton Bancroft	Missoula
Berg, Ida Blanche	Missoula
Berry, Agnes Dorothea	Missoula
Blood, Lorena Odelia	Mukwonago, Wis.
Breslin, Sarah	Butte
Bruner, Temple Alfred	Elkhorn
Bryan, Florence, Edna	McLeod
Bullard, Nell Cavette	Missoula
Burke, Mary Elizabeth	Missoula
Burns, Agnes T.	Wibaux
Burns, Mamie	Wibaux
Burns, Maud	Missoula
Carrol, Joseph Douglas	Wibaux
Clinger, D. S.	Laurel
Conrad, D. B.	Great Falls
Crane, Anna Laura	Missoula
Cuffin, Mary Blanche	Missoula
Culmer, Orpha Ann	Odon, Ind.
Cyr, Elsie Marie	Missoula
Dean, Mildred Elsie	Big Timber
Evans, Don Carlos	Livingston
Faherty, Anna	Missoula
Farmer, Eliza Ella	Missoula
Ferguson, Mary Ethel	Missoula
Finley, Phoebe Aditha	Missoula
Fontaine, Carrie Angelle	Missoula
Forrest, Dasie Ella	Bozeman
Giffin, Mary B.	Missoula
Gross, Gustave Adolph	Missoula
Hagen, Anna Irene	Neihart
Hanson, Emily Johanna	Choteau
Hass, Bertha	Wheaton, Minn.
Hassett, May Alice	Missoula
Henry, Minnie E.	Cresco, Iowa

Hord, Harriet . . . . . Missoula
Hutchinson, Annie Elizabeth . . . . . East Helena
Hynes, Anna Louise . . . . . Philipsburg
Jackson, Clifton Samuel . . . . . Hamilton
Jahn, Louise C. . . . . Winona, Minn.
Johnson, Elizabeth Virginia . . . . . Victor, Mont.
Johnson, Sarah Maude . . . . . Missoula
Kemper, David Alexander . . . . . Dillon
Knott, Mrs. Gertrude . . . . . Missoula
Kuphal, Herbert H. . . . . Missoula
Larson, Sallie Marie . . . . . North Branch, Minn.
Leaf, Lizzie Beulah . . . . . Missoula
Likes, Rella . . . . . Missoula
Lindfors, Verena Olive . . . . . Missoula
Little, Nat. S. . . . . Missoula
McDonald, Erina Corinne . . . . . Missoula
Madison, Fred Harold . . . . . Darby
Maley, Frances Jean . . . . . Missoula
Marsh, Hilda Frances . . . . . Missoula
Mason, Marjorie E. . . . . Missoula
Mathews, Florence May . . . . . Missoula
Merry, Katherine . . . . . Missoula
Norris, Grace Elizabeth . . . . . Drummond
Palmer, Grace Aileen . . . . . Fond du Lac, Wis.
Palmer, Kate Loomis . . . . . Fond du Lac, Wis.
Penglase, Mrs. Marie . . . . . Butte
Phillips, Mrs. Paul C. . . . . Missoula
Plant, Mamie Edith . . . . . Missoula
Porterfiend, Minnie . . . . . Fullerton, Neb.
Potta, Celia . . . . . Bridger
Rankin, Mary Frances . . . . . Missoula
Ratterman, Anne . . . . . St. Paul, Minn.
Rennich, Lenore . . . . . Missoula
Reinhard, Edna Owsley . . . . . Missoula
Richter, Frederich August . . . . . Missoula
Robinson, Fannie Clyde . . . . . Missoula
Roepke, Anna Ethel . . . . . Minneapolis
Rolfe, M. Edith . . . . . Missoula
Ronan, Margaret Theresa . . . . . Missoula
Samuel, Emma Louise . . . . . Racine, Wis.
Schanck, Donna Mariette . . . . . Libby
Shoup, Mittie Lois . . . . . Smithland, Iowa
Sloane, Ona Mansfield . . . . . Missoula
Smith, Chauncey Wayland . . . . Norridgewock, Maine
Smith, Katherine Monroe . . . . . Billings
Smith, Lulu Marie . . . . . Beloit, Wis.
Speer, Owen Dugald . . . . . Kay, Ind.

Spurgin, Minnie	Missoula
Stevens, Clayton Erwin	Westmore
Stone, Bessie Vera	Butte
Stuckey, Ralph Cameron	Belgrade
Summero, Margaret Florence	Missoula
Thompson, Nellie Florence	Missoula
Thompson, Garnet Neville	Missoula
Thurston, Arthur Eugene	Moore
Tilton, Hortense Hazel	Paradise
Torrence, Alta May	Butte
Van Vliet, Ethel May	Corvallis
Warnock, Grace Lucinda	Kalispell
Watts, Mary E.	Rockton, Ill.
Weir, Sarah Etta	Mukwonago, Wis.
Wells, Caroline Mary	Missoula
Westergaard, Harold	Red Lodge
Whiting, June Rose	Missoula
Woody, Franklin Hayes	Missoula

SUMMARY OF REGISTRATION

FOR ACADEMIC YEAR 1912-13.

	Men	Women	Total	"Old" Students	"New" Students	Total
Graduate	4	3	7	6	1	7
Senior	8	17	25	23	2	25
Junior	22	8	30	27	3	30
Sophomore	27	30	57	52	5	57
Freshmen	63	40	103	1	102	103
Totals	124	98	222	109	113	222
Summer School.	21	86	107	24	83	107
Totals	145	184	329	133	196	329
Short For. Course	14	0	14	3	11	14
Totals	159	184	343	136	207	343

Note—The above numbers do not include special students of the Department of Music, students doing summer work at the Biological Station, or students enrolled in Correspondence and Lecture courses of the University Extension department.

ANALYSIS OF RESIDENCE OF STUDENTS

* FOR ACADEMIC YEAR 1912-13.

Montana—	Men	Women	Total
Beaverhead County	3	2	5
Blaine County	1	0	1

	Men	Women	Total
Broadwater County	0	2	2
Cascade County	2	2	4
Chouteau County	1	0	1
Deer Lodge County	4	3	7
Fergus County	5	0	5
Flathead County	4	4	8
Granite County	3	1	4
Jefferson County	2	0	2
Lewis and Clark County	5	5	10
Lincoln County	0	1	1
Madison County	4	0	4
Meagher County	1	0	1
Missoula County	41	41	82
Park County	3	0	3
Powell County	1	1	2
Ravalli County	7	11	18
Rosebud County	0	1	1
Silver Bow County	5	7	12
Stillwater County	1	0	1
Sweet Grass County	2	3	5
Valley County	1	0	1
Yellowstone County	4	4	8
Other States—			
California	1	0	1
Idaho	4	0	4
Illinois	2	1	3
Indiana	2	0	2
Iowa	0	1	1
Kansas	1	0	1
Massachusetts	1	0	1
Minnesota	1	1	2
Michigan	0	2	2
New York	1	0	1
North Dakota	2	0	2
Pennsylvania	2	0	2
South Dakota	1	1	2
Washignton	2	2	4
Wisconson	2	1	3
Other Countries			
Canada	1	1	2
Totals	124	98	222

*—Short Forestry Course students and Summer School students not included.

ANALYSIS OF MAJOR SUBJECTS

* FOR ACADEMIC YEAR 1912-13.

	Graduate	Senior	Junior	Total
Biology	0	0	2	2
Botany and Forestry	0	1	1	2
Engineering (x)	0	2	5	7
English	0	1	6	7
Geology	1	0	3	4
History and Economics	1	4	3	8
Law (xx)	4	2	5	11
Literature	0	2	3	5
Mathematics	0	4	1	5
Modern Languages	1	6	1	8
Physics	0	1	1	2
Total	7	23	31	61

x—Also majors in engineering:

Sophomores	6
Freshmen	23

xx—Also special majors in law.

Sophomores	3
Freshmen	5

*—Short Forestry course students and Summer School students not included.

REGISTER OF ALUMNI

1898.

Mrs. Helen Robb Glenny, B. A. . . . . 1013 Lake St., Minneapolis, Minn.
Eloise Knowles, B. Ph. (Ph. M., University of Chicago) Missoula

1899

Zoe Bellew (Mrs. Sidney M. Ward), B. A. (M. A., 1902) . . . . . Hamilton
Earl Douglas (B. S., Iowa State College), M. S. . . . . Carnegie Institute, Pittsburgh, Pa.
Anna Louise Hatheway (Mrs. W. D. Harkins), B. S. . Chicago
George Hempstead Kennett, B. S. (M. D., Rush Medical College) . . . . . Kellogg, Idaho
Helen McCracken, B. A. (M. A., University of Chicago) . . . . . Hamilton
Charles Pixley, B. A. (M. D., Rush Medical College) . Missoula

1900

Charles Earl Avery, B. Ph. . . . . Missoula

Mary Gertrude Buckhous, B. S. . . . . Missoula
Caroline Harrington Cronkrite (Mrs. C. T. DeWitt Grubbs), B. S. . . . . Missoula
Lu Knowles, (Mrs. R. J. Maxey), B. S. . . . . Camp Josman, Iloilo, P. I.
Eben Hugh Murray, B. A. . . . (Address unknown)
Percy Shelley Rennick, B. Ph., (M. D., Kentucky Medical College) . . . . . Helmville
Sidney Elery Walker, B. S., (LL. B., University of Michigan) . . . . . (Address unknown)

1901

Estelle Bovee, B. Ph. . . . . Wibaux
Hugh Alexander Graham, B. S. . . . . 15 California St., San Francisco, Cal.
Sue Lewis (Mrs. W. A. Thompson), B. A. . . . . 1802 College Ave., East St. Louis, Ill.
Mary Lewis (Mrs. W. B. Simpson), B. A. . Leavenworth, Wash.
Lydia Jimmie Mills (Mrs. C. H. Rittenour), B. S. . Plains
Bertha Simpson, B. Ph. . . . . Missoula
Sidney Mire Ward, B. Ph. . . . . Hamilton
George Cutler Westby, B. S. (in M. E.) (M. S., 1909) . . . . . Salem, Ore.
Kathryne Clara Wilson, B. Ph. . . East Aurora, N. Y.

1902

John Frederick Anderson, B. S. (in M. E.) . . . . . (Deceased Oct. 3, 1910)
George Barnes, B. A. (Classical) (D. D., Oxford University) . . . . . Battle Creek, Mich.
Harold Blake, B. S. (in M. E.) . . . . Anaconda
William O. Craig, B. S. . . . . Helena
Helene Kennett (Mrs. Geo. Wilcox) B. A. (Literary) . . . . . Missoula
Helen La Caff (Mrs. Roy Jackson) B. A. (Classical) . . . . . (Deceased Jan., 1910)
Agnes McDonald, B. A. (Classical) . . . Anaconda
Homer McDonald, B. S. . . . . Great Falls
Alexander Grant McGregor, B. S. (in M. E.) . Douglas, Ariz.
Helen McPhail, B. A. (Classical) . . . Mace, Idaho
Fanny Maley, B. A. (Literary) . . . . . Missoula
Jeanette Pickering Rankin, B. S. . . . . Missoula
Katherine Ronan (Mrs. E. C. Trask), B. A. (Classical) . . . . . 1124 E. Fifth St. S., Salt Lake City, Utah
Margaret Ronan, B. A. (Classical) . . . . Missoula
Pearl Scott (Mrs. Fritz Kroger), B. A. (Classical) . Philipsburg
Guy Emerson Sheridan, B. S. . 659½ W. Granite St., Butte
Benjamin Stewart, B. S. . . . . Juneau, Alaska
Edith Watson (Mrs. C. H. Keel), B. A. (Classical) . Red Lodge

1903

Myrtle Weber Avery (Mrs. Charles E. Avery), B. S., (Classical) . . . . . Missoula
Miriam Hatheway, B. A. (Classical) . . . Missoula
Mabel Emily Jones, B. A., (Literary) . . . Missoula
Martin Jones, B. S. . . Cabanagan, Nueva, Luzon, P. I.
Lillian F. Jordan (Mrs. I. L. Bendon), B. A. (Literary) . . . . . Glendive
Lucy Likes, B. A. (Literary) . . . . . Missoula
Rella Likes, B. A. (Literary) . . . . . Missoula
Claude Otto Marcyes, B. A. (Literary) . . . . Forsyth
Wellington Duncan Rankin, B. S. . . . . Helena
Ida Rigby, B. A. (Literary) . . (Deceased Feb. 19, 1904)
Eloise Rigby, B. S. . . . . Carlton
Harriet Laura Rankin (Mrs. Oscar Sedman), B. A. (Classical) . . . . . Polson
Leslie Mitchell Sheridan, B. S. (in M. E.) . . Anaconda

1904

Page Bunker, B. A. (Classical) . . . . . Kalispell
Moncure Cockrell, B. A. (Classical) . . . . Deer Lodge
George Herbert Greenwood, B. A. (Classical) (M. A., Dartmouth College) . 443 Twenty-Second Ave., Spokane, Wash.
Walter Hammer, B. A. (Literary) . . . . . Foster
Alice Herr, B. A. (Literary) . 112 Rutgers, St. Belleville, N. J.
Roxane Howell (Mrs. J. A. Derge), B. A. (Classical) . Missoula
Georgia Evelyn Polleys (Mrs. D. T. Mason), B. A. (Literary) . . . . . Missoula

1905

Jessie May Bishop (Mrs. E. P. Giboney), B. A. (Literary) . . . . . Great Falls
Anna F. Carter, B. S. . . . . Missoula
William Oran Dickinson, B. S. . . . . Missoula
Alice Gertrude Glancy, B. A. (Literary) . . Lewistown
Herbert H. Hughes, B. S. (Ph. G., Chicago School of Pharmacy) (M. D., Rush Medical College) . Portland, Ore.
John Ray Haywood, B. S. (in Engineering) . Great Falls
Avery Faulkner May (Mrs. W. O. Dickinson), B. A. (Classical) . . . . . Missoula
Charles Edward Schoonover, B. A. (Classical) . . . . . (Deceased, March 21, 1909)
Frances Sibley, B. A. (Literary) . . . Sewanee, Tenn.
Charles Edward Simons, B. A. (Chassical) . . Missoula
Blanche May Simpson (Mrs. Frank Borg), B. A. (Literary) . . . . . Missoula
Ray Epperson Walters, B. A. (Classical) . Larson, Idaho
Edward Williams, B. A. (Classical) . . . . . 209 Wells Fargo Bldg., Portland, Ore.

1906

Fred Elliot Buck, B. E. (in M. E.) . . . . . Missoula
Joseph Buckhous, B. S. (in M. E.) . . . . St. Ignatius
Maud Burns, B. A. . . . . Missoula
Edwin Reed Corbin, B. S. (in M. E.) . . Nampa, Idaho
Mary P. Evans, B. A. (Classical) . . . . . Livingston
Grace Serena Flynn, B. A. (Classical) . . . Missoula
Thomas Leo Greenough, B. S. (in M. E.) . Larson, Idaho
Delbert I. Grush, B. S. (in M. E.) . . . . Anaconda
Floyd Hardenburgh, B. S. . . . . Missoula
Florence Matilda Johnson (Mrs. J. J. Moore), B. S. . . . . 2225 W. Polk St., Chicago, Ill.
Maud Esther Johnson, B. A. . . . . Missoula
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Thomas Claude Spaulding, B. S. (M. S. F., University of Michigan) . . . . . Forest Service, St. Maries, Idaho
Margaret Summers, B. A. (Literary) . . . . Missoula
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1907

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Lillian Warren, B. A. (Classical) . (Deceased, Feb. 22, 1908)
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1908

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Edward Angus Wenger, B. S. (Engineering . . Anaconda

1909

Almeda Andrews (Mrs. C. F. Farmer), B. A. (Classical), Missoula

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Marie Sophie Freeser, B. S. . . . . Two Dot
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William Montgomery Van Eman, B. S. (Engineering) . Augusta

1910

Mary Elizabeth Burke, B. A. (Latin) . . . Livingston
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Laura Seawright Johnson, B. A. (History and Economics) . . . . . Boise, Idaho
Lizzie Beulah Leaf, B. A. (Latin) . . . Townsend
Arbie Eugene Leech, B. A. (Economics) . . Dupuyer
Robert Campbell Line, B. A. (Economics and History) (A. M., Harvard University) . . . Cambridge, Mass.
Olive Helen Lovett, B. A. (Latin) . . . . Ismay
David Lamar Maclay, B. A. (Mathematics) . . . Lolo
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William James Tait, B. S. (Engineering) . . Anaconda

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1911

Florence Hale Averill, B. A. (Literature) . . Townsend
William Andrew Bennett, B. A. (Economics) . Belgrade
Arthur Fowler Bishop, B. S. (Forestry) . . . Helena
Conrad Henry Bowman, B. A. (History and Economics) Corvallis
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1912

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Florence DeRyke, B. A. (Literature) . Y. W. C. A. Troy, N. Y.

Clarence Jenks Forbis, B. S. (Biology) . . . Missoula
Ernest W. Fredell, B. S. (Engineering) . . Anaconda
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Ernest E. Hubert, B. S. (Forestry) . . . . Missoula
Birdie Florence Hunter, B. A. (Mathematics) . Columbus
Bessie Irwin, B. S. (Botany) . . . . . Lolo
Sarah Maude Johnson, B. A. (History and Economics) Missoula
Florence Leech, B. A. (Modern Languages) . . Valier
Holmes Maclay, B. S. (Geology) . . . . . Lolo
Maude Brooks McCullough, B. A. (Modern Languages) Missoula
Milton Mason, B. S. (Engineering) . . Pittsburgh, Pa.
Arthur William O'Rourke, B. S. (Economics) . . . Helena
Grace Evelyn Rankin, B. A. (History and Economics) Missoula
David Dudley Richards, B. S. (Geology) . . . . Butte
Annabelle Robertson, B. A. (Latin and Greek) . Hamilton
William Emmett Ryan, B. S. (Geology) . . . .Valier
Azelie Agnes Savage, B. A. (Modern Languages) . Ronan
Shirlie Belle Shunk, B. A. (History and Economics) . Missoula
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Beulah Van Engelen (Mrs. Douglas P. Lucas), B. A. (Literature) . . . . . Missoula
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Helen Wear, B. A. (Latin and Greek) . . . Helena
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Gertrude A. Whipple, B. A. (Modern Languages) . Helena
Edward Alexander Winstanley, B. S. (Geology) . Missoula

HONORARY DEGREES CONFERRED

1901

Thomas H. Carter, LL.D. . . (Deceased, Sept. 17, 1911)
United States Senator.

1902

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

1904

Hiram Knowles, LL.D. . . . (Deceased, April 7, 1911)
United States Judge.

1909

Howard Taylor Ricketts, LL.D. . (Deceased, May 3, 1910)
Professor, University of Chicago.

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All matter sent in exchange and all orders, or requests for information concerning the Bulletins should be addressed to The Library, University of Montana, Missoula, Montana, U. S. A.

The following scientific publications have been issued:

PSYCHOLOGY.—Studies in Psychology, edited by W. F. Book.

Vol. 1. The Psychology of Skill, with Special Reference to Its Acquisition in Typewriting, by William Frederick Book. Pages 185, plates 15, December 1, 1908. Price, $1.00.

BIOLOGY.—Morton J. Elrod, editor.

No. 1.—The Summer Birds of Flathead Lake, by P. M. Silloway. Pages 83, plates 16, 1901.

No. 3. A Biological Reconnoissance in the Vicinity of Flathead Lake, by M. J. Elrod. Pages 182, plates 29, 1902.

No. 5. Lectures at Flathead Lake. Pages 97, plates 6, 1903.

No. 6. Additional Notes to Summer Birds of Flathead Lake with Special Reference to Swan Lake, by P. M. Silloway. Pages 19, plates 7, 1903.

No. 7. Lichens and Mosses of Montana, by Wilson P. Harris and Caroline W. Harris. Pages 22, plates, 7, 1904.

No. 10. Butterflies of Montana with Key for Determination of Species, by Morton J. Elrod. Pages 174, plates 14, 1906.

No. 11. A list of the Fishes of Montana with Notes on the Game Fish, by James A. Henshall. Pages 12, plates, 1, 1906.

No. 14.—Pictured Rocks, Indian Writings on the Rockcliffs of Flathead Lake, Montana, by Morton J. Elrod. Pages 10, plates 10, 1908.

No. 15. Montana Botany Notes by Marcus E. Jones. Pages 75, plates 6, 1910.

N. B.—Numbers 2, 4, 8, 9, 12, 13, of Biological Bulletins were brief annual announcements of the Biological Station.

GEOLOGY.—Jesse Perry Rowe, editor.

The Neocene Lake-Beds of Western Montana, and Descriptions of some New Vertebrates from the Loup Fork, by Earl Douglass. Pages 27, plates 4, 1900.

No. 1. Some Volcanic Ash-Beds of Montana, by J. P. Rowe. Pages 29, plates 9, 1903.

No. 2. Montana Coal and Lignite Deposits, by J. P. Rowe. Pages 82, plates 26, 1906.

No. 3. Some Economic Geology of Montana, by J. P. Rowe. Pages 70, plates 46, 1908.