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1900-1901 Course Catalog

University of Montana--Missoula. Office of the Registrar

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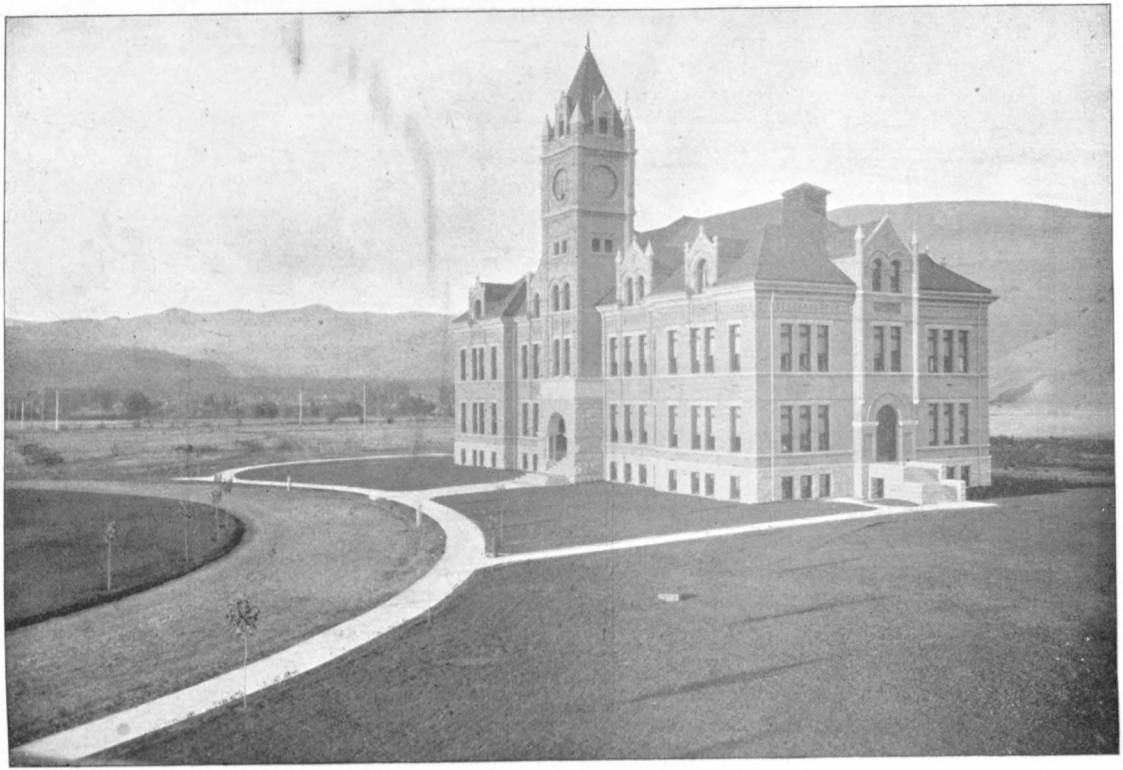
UNIVERSITY OF MONTANA

Annual Register

1900-1901



UNIVERSITY HALL

. . . THE . . .

SIXTH ANNUAL REGISTER

OF THE

University of Montana

Missoula, Montana

1900-1901

With an Outline of the Course of Study and the
Departments of Instruction for
1901-1902

HELENA, MONTANA
STATE PUBLISHING COMPANY
STATE STATIONERS, PRINTERS AND BINDERS

CALENDAR FOR 1901-1902.

1901.

JULY

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The Montana State Board of Education.

Ex-Officio.

GOVERNOR JOSEPH K. TOOLE, President.
JAMES M. DONOVAN, Attorney General.
W. W. Welch, Supt. Pub. Instruction, Secretary.

Appointed.

J. M. HAMILTON, Missoula.....Term Expires February 1, 1902
J. P. HENDRICKS, Butte..... " " " 1, 1902
N. W. McCONNELL, Helena..... " " " 1, 1903
O. F. GODDARD, Billings..... " " " 1, 1903
O. P. CHISHOLM, Bozeman..... " " " 1, 1904
J. G. McKAY, Hamilton..... " " " 1, 1904
N. B. HOLTER, Helena..... " " " 1, 1905
G. T. PAUL, Dillon..... " " " 1, 1905
J. M. LEWIS .....Clerk of the Board

EXECUTIVE COMMITTEE OF THE STATE UNIVERSITY.

J. H. T. RYMAN, President .....Missoula
T. C. MARSHALL, Secretary .....Missoula
HIRAM KNOWLES .....Missoula

The Faculty.

OSCAR J. CRAIG, A. M., Ph. D., President.
Professor of History.

CYNTHIA ELIZABETH REILEY, B. S.,
Professor of Mathematics.

W. M. ABER, A. B.,
Professor of Latin and Greek.

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

MORTON J. ELROD, A. M.,
Professor of Biology.

ARTHUR L. WESTCOTT, B. M. E.,
Professor of Mechanical Engineering.

FRANCES CORBIN,
Professor of English Literature.

WILLIAM D. HARKINS, A. B.,
Instructor in Chemistry and Physics.

JESSE P. ROWE, B. S.,
Instructor in Physics and Geology.

ELOISE KNOWLES, Ph. B.,
Instructor in Drawing, and Assistant in English.

MRS. WALTER WHITAKER,
Instructor in Music.

GRACE HERNDON,
Instructor in Vocal Music and Physical Culture.

LOUISE HATHEWAY, B. A.,
Assistant in Preparatory Department.

MARY A. CRAIG, B. S.,
Librarian.

JOHN F. DAVIES, A. M.,
Expert Librarian.

The University and its Endowment.

The University of Montana was created by an act of the Montana State Legislature, approved February 17, 1893. The following extracts give the title of the act; and also certain sections that indicate the purpose of the University and the scope of its work.

"An Act to establish, locate, maintain, and govern the University of the State of Montana.

Section 1. "There is hereby established, in this State at the City of Missoula, an institution of learning under the name and style of the University of Montana."

Section 6. "The object of the University of Montana shall be to provide the best and most efficient manner of imparting to young men and women, on equal terms, a liberal education and thorough knowledge of the different branches of Literature, Science and the Arts, with their varied applications; and to this end there shall be established the following colleges or departments, to-wit:

First—A Preparatory Department.

Second—A Department of Literature, Science and the Arts.

Third—Such professional and technical colleges as may from time to time be added to or connected therewith.

The Preparatory Department may be dispensed with at such rate and in such wise as may seem just and proper to the State Board of Education."

Section 7. "Such duties or Courses of Instruction shall be pursued in the Preparatory Department as shall best prepare the students to enter any of the regular colleges or departments of the University.

"The college or department of Literature, Science, and the Arts shall embrace courses of instruction in Mathematical, Physical and Natural Sciences with their applications to the Industrial Arts; a liberal course of instruction in the Languages, Literature, History, Philosophy, and such other branches as the State Board of Education may prescribe. And, as soon as the income of the University will allow, and in such order as the demands of the public seem to require, the said

courses of instruction in the Sciences, Literature and the Arts shall be expanded into distinct colleges or departments of the University, each with its own Faculty and appropriate title."

Section 9. "Tuition shall ever be free to all students who shall have been residents of the State for one year next preceding their admission; except in the Law and Medical Departments, and for extra studies. The State Board of Education may prescribe rates of tuition for any student in the Law or Medical Department, or who shall not have been a resident as aforesaid, and for teaching such studies."

ENDOWMENT.

Section 11. "For the support and the endowment of the University there is annually and perpetually appropriated—

"First—The University Income Fund and all other sums of money appropriated by law to the University Income Fund.

"Second—All tuition and matriculation fees.

"Third—All such contributions as may be derived from public or private bounty.

Section 10. Any person contributing a sum not less than fifteen thousand dollars ($15,000) shall have the privilege of endowing a professorship in the University, or any department thereof, the name and object of which shall be designated by the State Board of Education."

By an act of Congress dated February 18, 1892, 46,080 acres of land were donated to the State of Montana for University purposes. This land was granted by the Federal Government upon condition that the proceeds from the sale of such lands should become a Permanent University Fund.

The Income Fund arises from the rental of lands unsold, from licenses to cut trees and from the interest on the proceeds of the sale of lands invested in the Permanent University Fund. This fund is applied to the payment of the bonds, principal and interest, which were issued in 1897 for the construction and equipment of buildings.

The University lands have all been selected. They comprise some of the very best lands in the State and are rapidly increasing in value.

The Equipment of the University.

DESCRIPTION OF CAMPUS AND BUILDINGS.

THE UNIVERSITY CAMPUS.

The University Campus 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. A substantial beginning has been made toward the improvement of the Campus. A double row of trees was planted along the north, west and south sides three years ago. Near the center an oval lawn of about three acres in extent is marked out by a broad graveled driveway; around this is a sidewalk; with a space between the walk and driveway for grass, flowers, or shrubbery. The entrance to this driveway is at the western side, from University Avenue.

A double row of trees is planted around the drive, one on the lawn around the inner edge of the drive, the other on the outer side of the walk. The trees planted this year, and the lawns started around the buildings and within the oval, have made an excellent growth, and already present a beautiful appearance.

The northwestern corner of the Campus has been laid out for an athletic field, and some work has been done there.

BUILDINGS.

University Hall, the larger building, stands on the east side of the oval, directly opposite the entrance to the driveway, facing the west. A little to the south stands Science Hall, which faces toward the northwest, and, like University Hall, fronts upon the oval.

A little north of University Hall stands the bicycle shed, a small, neat building, in harmony with its surroundings. In the rear of University Hall stands a shed for the shelter of horses.

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 so largely above ground as to be well lighted and fit for any sort of use. The basement walls are of granite; above rise double brick walls of the most substantial character; the inner partition walls are also of brick.

Throughout the building, from basement upwards, is a uniform, handsome finish of dark tamarack and white pine wainscoting, in alternate strips; above this are white plaster walls.

Every room is connected with a large ventilating shaft, whose outlet is above the roof. The steam-heated radiators are fitted with a cold-air box, whose connections with the outer air through the walls of the building can be opened and closed at pleasure. When these are open, fresh air is drawn into the room through the radiator, while the air of the room is drawn out through the ventilating shafts. This ventilating arrangement, while simple and inexpensive, is found to be efficient. Ample heat is furnished by the steam plant in Science Hall. The three essential requirements—light, heat, and ventilation—are well supplied.

The basement has a wide hallway running through it between the north and south entrances, with rooms on each side. This hall is divided in the center by a partition, which separates the whole basement into a northern and southern half, whose sole connection is the door through this partition. The northern hall contains two small store rooms, now used by the Library, a room for the advanced work in drawing, a fire-proof vault, a cloak room, and a toilet room for women. The southern half contains two small storage rooms, a photographic dark room, a toilet rooms for men, and three large rooms, used at present as storage and work rooms for the Museum, and for the Departments of Biology and Geology.

From each half of the basement a stairway rises to the first floor. This floor, like the basement, is divided lengthwise by a broad hallway, extending between north and south entrances. The main entrance to the building, through the tower at the center of the western front, opens into this hallway. The center of the eastern half of the floor, all that part lying between the northern and southern stairways, is occupied by the Library, which also furnishes a reading and study room.

At the northeastern corner of the floor is the room for drawing, and at the southeastern is the Museum. The western half of the floor contains, in the southern part, the Laboratory and Lecture Room of the Biological Department, and in the northern part, the Lecture Room for History, the President's

office, and a room for the use of the Faculty and its Secretary.

The central part of the second floor is occupied by the Assembly Hall, a room of fine proportions and simple but elegant adornment. In height it rises through two stories, and has a gallery whose entrances are on the level of the third floor. The main floor of the Hall is seated with about 300 opera chairs, and the gallery will accommodate about 150.

The second floor has three rooms on each side of the Assembly Hall. On the northern side are the rooms for Mathematics and Modern Languages, to the latter of which is attached a smaller recitation room. On the southern side are rooms for Literature and Ancient Languages, and a smaller recitation room.

The central part of the third floor is occupied by the gallery of the Assembly Hall; north of this is a large room for the literary societies, and a recitation room; south of the gallery is the Gymnasium, which extends along the whole southern end of the building; adjacent to this is a smaller room, used for storage.

The whole building contains thirty-one rooms, without including six small rooms in the rear of the Assembly Hall—three on the second and three on the third floor. These rooms furnish a passage way from one end of the building to the other, without going through the Assembly Hall, and may also serve as cloak rooms; those on the second floor give access from the rear to the platform of Assembly Hall.

The most important of the rooms in University Hall are the Assembly Room, Library, Museum, Literary Society Hall, Gymnasium, Offices, Biological Laboratory, and seven lecture rooms of uniform size, for the departments of History, Drawing, Biology, Mathematics, Literature, Modern Languages and Ancient Languages.

The Library.

The Library must always be the center of all college and university work. Without an adequate book supply the work of every department must be narrowed and curtailed. The accumulated knowledge of the ages is recorded in books. There is no line of student work or investigation but demands the use of books.

With the limited means at command, the attempt has been not to supply what was needed, but to supply that which is indispensable and absolutely demanded by the work already in progress in the different departments of the University.

The literary and scientific periodicals are carefully selected, with reference to the department work.

Within the past year the books have all been catalogued and indexed. The cards give accession number, author, title, and other necessary details concerning the books.

The books are being shelved and classed according to the Dewey decimal system. This work will include all pamphlets and periodicals, thereby making all of the material of the library accessible and easily drawn upon. The following are the rules governing the Library and Reading Room:

VII. LIBRARY AND READING ROOM.

1. The Library shall be open for reading and study at such hours as the Faculty may prescribe, and in these hours conversation, or other conduct which may divert attention or otherwise annoy, shall not be allowed.

2. Any one wishing any book or periodical (dictionary excepted) must apply to the Librarian for it, and before leaving the room the same must be returned to the Librarian, if not regularly drawn.

3. Books not marked "Reference Book' may be drawn from the Library and retained one week, and then may be redrawn for another week, but no book can be kept by one person longer than two weeks.

4. If a book is not returned within the week for which it is drawn the holder shall be subject to a fine of 10 cents; if not returned within two weeks from the time it was drawn, a fine of 25 cents; if not returned within a month a fine equal to the price of the book.

5. Reference books, current periodicals and papers cannot be taken from the library room except by special permission of the Librarian, and then only from the closing of the Library to the first succeeding hour of opening.

6. A violation of any of the foregoing regulations, or other rules, which may from time to time be prescribed, may forfeit a student's right to the use of the Library for such time as may be designated.

7. It is the duty of the Librarian to enforce the above regulations.

The following is a list of magazines and periodicals on file for the use of members of the University:

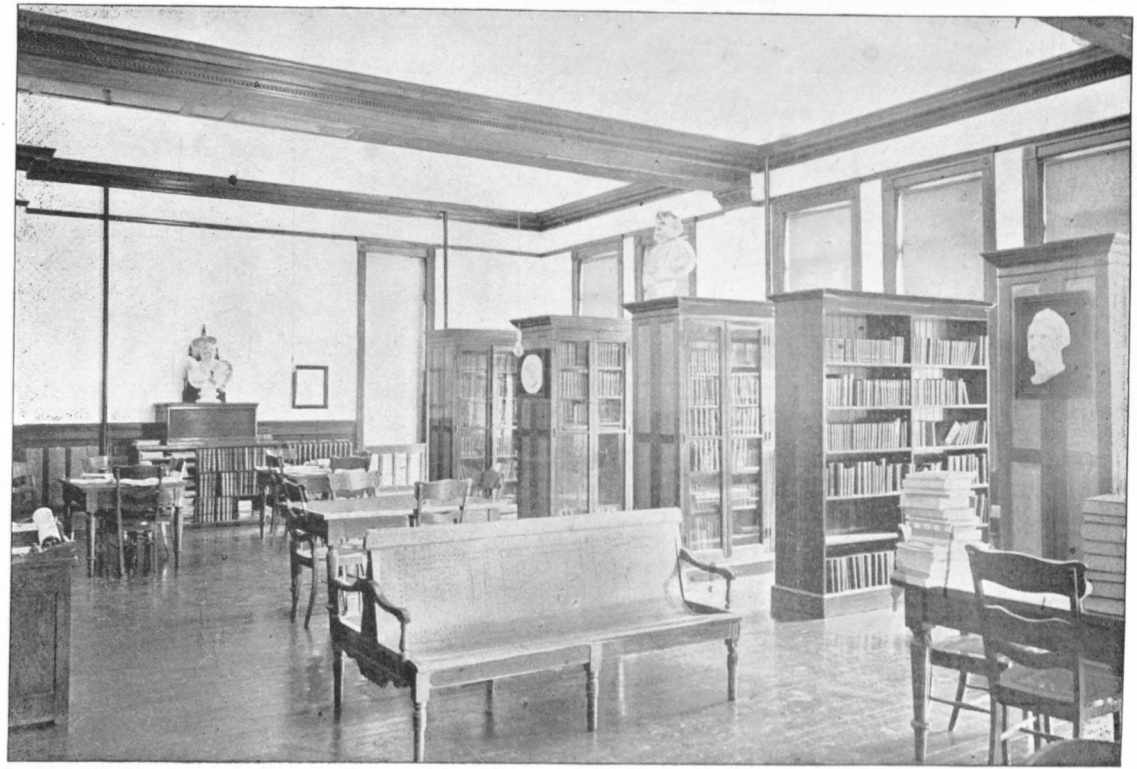
The Forum.
Scribner's Magazine.
Chautauquan.

Forest and Stream.
The Chemical Journal.
The American Chemical Society Journal.
The School Review.
Book Reviews.
The Monist.
Education.
Zeitschrift fur Anorganische Chemie.
Botanical Gazette.
The Classical Review.
The Journal of The Association of Engineering Societies.
The Engineering and Mining Journal.
Power.
The Electrical Review.
The Public School Journal.
Public Opinion.
Fliegende Blaetter.
Merck's Report.
The Bookman.
The Literary Digest.
The Artist.
The International Studio.
Popular Science Monthly.
Harper's Weekly.
Harper's Monthly Magazine.
North American Review.
Atlantic Monthly.
The Cosmopolitan.
The American Naturalist.
Science.
Journal of Geology.
Public Libraries.
Library Journal.
Publisher's Weekly.
Literary News.
The Scientific American and Supplement.
The Railway Age.
Foundry.
Entomological News.
The Analyst.
American Archaeologist.
Bulletin de la Chemique.
Journal of London Chemical Society.

American Journal of Mathematics.
Zum Fels und Meer.
Die Gartenlaube.
Illinois Staats Zeitung.
Ueber Land und Meer.
Psyche.
Nature.
The American Monthly Microscopical Journal.
The Journal of Applied Microscopy.
The American Journal of Science.
Bird Lore.
Zoologischer Anzeiger.
Journal of Morphology.
The Photographic Bulletin.
The American Architect.
The Outlook.
The Anaconda Standard.
Current History.
The Educational Review.
School and Home Education.
Engineering News.
Engineer's Magazine.
Cassier's Magazine.
The American Machinist.
The Electrical World.
The Western Electrician.
Mining.
Political Science Quarterly.
Ladies' Home Journal.
Helena Independent.
American Journal of Psychology.
The Independent.
The Dial.
The Century Magazine.
Review of Reviews.

The following newspapers are donated by their respective publishers:

Ravalli County Democrat.
The Chronicle, Bozeman.
The Western News, Hamilton.
The Avant Courier, Bozeman.
The Billings Times.
The Glendive Independent.



LIBRARY

The Neihart Herald.
The Silver State.
The Madison County Monitor.
The Big Timber Express.
The Edward's Fruit Grower, Missoula.
The Yellowstone Leader, Big Timber.
The Helena Herald.
The Inter Mountain, Butte.
The Chinook Opinion.
The Sentinel.
The Philipsburg Mail.
The Citizen's Call.
The Western Mining World.
The Inter-Lake.
The Tribune, Butte.
The Weekly Tribune, Dillon.
The Northwest Tribune, Stevensville.
The Rocky Mountain Husbandman.
Mining, Spokane.
The Dillon Examiner.
The Townsend Messenger.
The Jefferson County Sentinel.
The Big Timber Pioneer.
The Forsyth Times.
The Carbon County Democrat.

STATEMENT.

Number of bound volumes in Library	6189
Number of volumes, unbound	325
Number of pamphlets	6000
Number of periodicals	71

Department of Chemistry.

THE CHEMICAL LABORATORIES.

The Department of Chemistry occupies the whole of the second floor of Science Hall, which contains six rooms and a hall. The student laboratories, two in number, are on the north side of the hall; the lecture room, store room, and office and private laboratory of the professor are on the south side. The balance room, also used for a library and reading room, is at the end of the hall, and opens into the quantitative laboratory only.

Of the two laboratories, the larger is for the work in general chemistry and quantitative analysis. This is fitted with two rows of desks, underneath which are arranged the drawers, forty in number, for the students' apparatus. Each desk is provided liberally with running water at the many sinks, with taps for water on the desk, and tips for gas. The laboratory will accommodate forty students in all, with a maximum number of twenty-four in one section. Each student is given a full set of apparatus, which is locked with a padlock, thus assuring safety.

The reagents are stored in large glass-stoppered, tubulated bottles, in one corner of the room. The ventilation for the laboratory is procured through five hoods, each connected with a separate steam-heated flue. Water and gas are brought into each hood.

The smaller quantitative laboratory will accommodate sixteen students at once. This room has northern and western exposures, and is therefore well lighted. The arrangement of hoods and flues is the same as in the other. The arrangement of drawers for the apparatus is much more complete than in the smaller laboratory. Eight separate drawers or closets, all locked by one padlock, are given each student. This insures perfect safety for the many pieces of apparatus and solutions in use. The desks are all fitted with stationary iron stands, of the uni-

versal type, which allows the desk to be used in all of the many ways necessary for analytical work. Each desk has also an iron plate heated by gas burners. The gas is furnished to the student either by the ordinary gas tip, with rubber connection, or by a stationary swinging gas jet, fitted with the Bunsen burner. Water is brought to each desk in taps, or to the many sinks in the usual manner. Brass suction pumps are attached to the latter, and a good suction obtained for filtration processes. The reagents are provided at each desk and in more complete sets in a suitable case in one corner. The sets of apparatus issued to each student are very complete and consist of beakers, flasks, crucibles, burettes, pipettes, bottles, etc.

The balance and reading room opens into the quantitative laboratory. In it are two Becker balances, sensitive to .2 mg., for the beginners in quantitative analysis. Shelves are fastened to the solid wall, and independent of the floor, for four balances.

The Department Library, placed in this room, is under the direction of the General Library and subject to such restrictions as will insure the safety of the books. The following books are placed here for the use of students: 125 volumes pertaining to Chemistry, analytical, organic, inorganic, physical, and industrial. This list includes many volumes of importance, as in Inorganic Chemistry, by Mendjeleff, Freer, and eight volumes by Roscoe and Schorlemmer; in Analytical Chemistry, works by Fresenius, Classen, Menschutkin, Crookes, Behrens, Blythe, and many others; in Organic Chemistry, by Remsen, Prescott, Gatterman, Bernthsen, Sadtler, Schorlemmer, and others; in Physical Chemistry, by Ostwald, Van't Hoff, Meyer, Eiloart, Ramsay. Besides these, the four volumes of Watts' Dictionary of Chemistry are here found. In Geology are 100 volumes, covering a great range of topics, including Mineralogy, Metallurgy, Glacial Geology, Economic Geology, and Paleontology. Of special note in this line is a complete set of the Mineral Industry, and the works of Dana, Le Conte, Shaler and others. The bulletins of the U. S. Geological Survey, that treat of subjects in Geology and Paleontology, are also placed in this library. In Physics are 60 volumes. Besides these, 12 of the scientific journals pertaining to Chemistry, Physics and Geology, in both English and foreign languages, are available to the student in this room.

The lecture room, on the south side of the hall will seat forty persons, and is provided with the usual accommodations for taking notes from lectures. The lecture table, 4x14 feet, is pro-

vided with water and gas, and is very convenient for lecture experiments. Over the lecture table is mounted a geological chart. This chart is six feet wide and over 300 feet long, and so mounted by rings sliding on a cable that it can be easily moved along to show the designs thereon presented. It is made to represent the succession of life throughout the different periods of geological history. The plant and animal life is faithfully depicted by paintings in oils, while many of the geological changes and processes, as sedimentation, erosion, volcanic eruptions, faulting, etc., are also depicted. The geological order is faithfully followed,and altogether this chart is a useful and valuable aid in presenting the subject of paleontology.

In the rear of this room four tables are provided for the use of the students in Determinative Mineralogy, Blowpipe Analysis and in General Geology. Gas is brought to these tables for the blowpipe work. Six new and neat mineral cases have been placed here, containing several valuable sets of rocks and minerals for Laboratory work in Geology.

The private Laboratory and office of the professor is a well-lighted room, 12x18 feet in size, located in the corner of the building. It opens into the lecture room and into the store room. It is provided with a laboratory desk, a hood, balance shelf, and is supplied with water and gas. An accurate analytical balance and a first class assay balance have been ordered for this room, and will be used for the most accurate determinations.

The store room adjoins the office, and opens also into the lecture room. Students can obtain material from this room through a small window opening into the hall. In this way the room is easy of access to the students when working in the laboratories. The store room contains, besides the ample shelves and cases for storage, a desk provided with gas, water and suction. This is used for preparation work and is a great convenience. Ventilation is secured by means of a hood of ample size. The laboratories and rooms are all lighted by electricity, or by gas light from Welsbach burners.

Distilled water is made in a block tin still, placed in the attic above the laboratory, and is conducted to the large laboratory through block pipe tin. The still is connected with the steam heating system and is so arranged that it is impossible for any solid or other foreign substance to pass from the system into the condenser. The water is collected in a 20-gallon stone reservoir, thence conducted to the rooms below. The still is so connected as to require no attention, as it is connected with an

overflow into the sewer. On the whole, this plant is a model of its kind for small laboratories.

The gas is made from gasoline by means of a machine from the Detroit Gas Machine Co., of Detroit, Mich. The capacity of the carburetter is 465 gallons of gasoline, and is ample for all uses of the present laboratories connected with it. The plant is provided with a combination mixer, furnished by this company, which is believed to be a valuable adjunct to the machine.

ASSAY LABORATORY.

Funds have been appropriated for a new equipment for the assay laboratory. New coal and gasoline furnaces, a high grade assay balance, pulp balance, etc., will be in place so that they will be available for use during the coming year. For the course in assaying, see under Courses of Instruction in Chemistry.

Department of Physics and Geology.

DESCRIPTION OF PHYSICAL LABORATORY.

The Department of Physics occupies one-half of the floor space on the ground floor of Science Hall. One lecture room and one laboratory are provided, which adjoin each other and are used to supplement each other in many ways. The lecture room has a seating capacity of fifty, with the usual arm-rests for the taking of lecture notes. Provision is made for darkening the room by means of rolling shutters, which are easy of manipulation and give a perfect exclusion of all light. A porte lumiere has been mounted in a window of southern exposure to furnish illumination in the daytime. The Colt's projection apparatus is used for projection, either by sunlight, electricity or by the lime light.

The lecture table is provided with gas, water, and suction. The laboratory is a room 24 feet square, lighted by windows of eastern and southern exposure. It is provided with two rows of tables in which are forty-six lockers for students' apparatus. Twenty-four students can work in this laboratory at one time. Each desk is provided with gas from taps in the center of the table. Water is brought to the laboratory at two places, where sinks are placed conveniently.

The apparatus is stored in cases, which line the sides of the laboratory and lecture room, and can be drawn out by the student as needed. All of the material necessary for a complete course of elementary physics, as outlined by the Science Department of the National Educational Association, is now available for student's use. Some special pieces for advanced work are also on hand, as, many forms of galvanometers, Atwood's machine for falling bodies, a 9" induction coil, a cylinder of liquid carbon dioxide, an excellent air pump, several X-ray tubes, a large Toepler-Holtz machine, dynamos, electric motors, etc.

GEOLOGY AND MINERALOGY.

The provisions made for laboratory work in these subjects have been much increased during the last year. The laboratory work in Determinative Mineralogy, Lithology, Blowpipe Analysis, etc., is done in the Chemical Lecture room at tables specially prepared therefor. The work in Paleontology is done in the research laboratory in University Hall.

The collections have been differentiated during the year into nine distinct collections, as follows: 1. A complete set of minerals which is placed on exhibition in the Museum. 2. A duplicate set of minerals in cases in Science Hall for class work in Determinative Mineralogy. 3. The collection of ores and metallurgical products in the Museum for work in Economic Geology. 4. The Invertebrate Fossils in drawers in the Museum, labelled and recorded. 5. A set of type specimens of rocks, igneous, sedimentary and metamorphic, in Science Hall for class work in Lithology and Geology. 6. A set of rock specimens representing the formations of such parts of the State as has been exploited or studied. 7. One set of specimens to illustrate Structural Geology and the various phenomena of geological action as far as possible, also a set of Frazer's Structural Geology including a large piece of columnar besalt and several beautiful stalactites and stalagmites. 8. One set of Crystal models of 108 figures; and one set of Preston's Modified Celluloid Crystals for study in Crystallography. 9. Crosby's set of 150 Common Rocks and Rock-forming Minerals for study in General Geology.

A large chart has been prepared for the purpose of illustrating the animal life during each of the past Geological epochs. This is mounted in the Chemical Lecture room where the class work is done. The apparatus for field work in Geology consists of a Gurley geologist's compass, an aneroid barometer reading to 16,000 feet, a 50 foot calibrated steel tape, drawing instruments, etc.

Department ot Biology.

THE BIOLOGICAL LABORATORIES.

The Biological Laboratories are in University Hall. On the first floor are two rooms and the Museum. In the basement, reached by a private stairway, is the dark room for photography, a store room, a room for general work, and a room for museum and laboratory. Across the hall is another room, 24x30, used as an unpacking room and room for general work, and used conjointly by the departments of Biology and Geology.

On the first floor, the first door to the right as one enters from the front opens into the Biological Lecture Room. This room contains seats for 20, besides laboratory desks for advanced students. It contains one large case of books, one large case for apparatus, a hood case for fumes, a small storage case, and a sink with water.

The room adjoining is used for beginning laboratory work, and contains sixteen tables, besides a large case of material, a microscope case, a sink with four compartments, and a case containing a skeleton.

The tables are of a special pattern, planned by the professor, and are admirably adapted to the work. They are 28 inches high, 48 inches long, 28 inches wide. Each table contains on either side two drawers and a space below with a door. The drawers are locked by a wooden bar, and the door has a combination lock. One lock, therefore, locks the three compartments. The tops are of oak, 1 1-2 inches thick. Each student works individually at a table, and the tables are just high enough to permit the use of a microscope vertically without discomfort. Each desk is fitted with gas, and when light is needed the rooms are well lighted by incandescents. The paraffine baths are kept in the fume hood, and by thermostats may be kept at constant temperature night and day.

The microscope case is worthy of notice. This contains thirty-five compartments, each locked with a combination lock.

MUSEUM

Each microscope is placed in a compartment and locked up. When the students are assigned a microscope they are given the combination, and they alone have access to the instrument. In this way injury to the instruments is easily traced to the proper source.

The large sink is in four compartments, each with an overflow. Living material can thus be kept at all times.

The dark room for photography is nine feet square, contains a long table with sink, has water, gas and electric light. There are shelves and racks for storage of negatives, plates and other material.

The store room is about nine by twelve, with a rack built from floor to ceiling for storage of glassware, chemicals, and other material.

At the foot of the stairway, in the basement, a room twenty by twenty-four is used as a work room for the professor and advanced students. In this room is a small case for storage, a fume hood, several tables, and shelves. Here is done such work as preparing insects for the Museum, mounting botanical specimens, and assorting material. The basement rooms are light, dry and airy, and as pleasant as any rooms in the building.

Adjoining the preceding room is another room, filled with cases, and used both as a museum and as a laboratory.

Across the hall is a large basement room, fitted with shelves. This room is used for unpacking, for storage, for cleaning up specimens, etc. It is used conjointly by the departments of Biology and Geology.

The microscopical equipment is as follows: There are two compound microscopes by Leitz. One of these microscopes is the best made by this firm, and has the following accessories: Three eye pieces, a series of five objectives, one being a one-twelfth oil immersion. It has also a revolving stage, with sub-stage condenser after Abbe, and with the iris diaphragm. It has eye and stage micrometers, and accessory Nicol prisms for polarization, and alos a camera lucida after Abbe.

The other Leitz instrument has two eye pieces and three objectives. There are sixteen microscopes by Bausch & Lomb Optical Co. Four of these have two eye pieces and two objectives, with sub-stage condenser for illumination. The other twelve have one eye piece and two objectives. There are also two dissecting microscopes by Bausch & Lomb Optical Co. and one by Leitz. In addition to the microscopes there is a battery of extra objectives, three inch, two inch, one inch, one-half inch,

one-fourth inch, one-eighth inch, and one-tenth oil immersion, to give greater range of work.

The department has a good supply of working apparatus, consisting of the following material: Anthony's copying, reducing and enlarging camera, with accessories for making lantern transparencies; a Leitz vertical camera for photomicrography; a pair of balances; a Miller paraffine bath and a Naples water bath, each with thermostat; an adjustable drawing board for camera lucida; an incubator, with thermostat, for use in bacteriology and embryology; a Minot microtome; a student microtome; three Abbe camera lucidas; insect cages; turn tables; hardware; glassware; chemicals, etc., for carrying on histological and general biological work.

The department has considerable photographic material, and in conjunction with the work in Geology a beginning has been made for a collection of photographs to be used in class work. Several hundred lantern slides have been made. The intention is to make the stereopticon a valuable adjunct in the department through the medium of photography.

For working material there is a collection of alcoholic vertebrates and invertebrates, land, fresh water and marine, made by purchase and collecting; more than a thousand skins, of several hundred species, of North American birds; specimens representing several hundred species of North American shells; a collection of hundreds of mounted and unmounted insects; an herbarium of several thousand species of phanerograms; a collection of fishes; a series of a couple of thousand mounted slides; a large amount of working material from the state, collected by the department, by the Biological Station, and received through donations.

BIOLOGICAL STATION.

The Station is located on the bank of Swan River at its outlet into Flathead Lake. It was established in the spring of 1899.

The laboratory is a one-story frame structure, 18x24, containing a small store room, a dark room, and tables for twelve students. It is substantially built, well lighted, and well suited to outdoor work.

The Station is in possession of three boats for use in the work; a naphtha launch "Missoula," a row boat "Culex," and a canvas boat "Daphnia." These boats enable the Station force and those attending to get around very nicely. In addition to

the above the Station is in possession of numerous smaller pieces of material; a pump after plans of Ward, plankton net after plans of Kofoid, insect nets, dredges, camp material, and other necessary appliances are supplied for the work. Microscopes, chemicals, glassware, and books are taken annually from the University for use at the Station.

The Museum.

The Museum proper is on the first floor of the main building. One room is allotted for storage of the collections, and is packed full. The room is filled with cases, along the walls and in the interior. The cases are made after the best patterns, of native lumber, and display the collections to advantage. The walls are covered with insect cases containing mounted insects. Above the cases toward the ceiling, are arranged the agricultural exhibits received from the Omaha Exposition, the large fishes mounted, collected and donated by Mr. R. A. Eddy, and the few mounted birds of large size in the museum.

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; a collection of ores and minerals, received through donations, by collecting, and from the exhibit at Omaha; a collection of insects, partly through purchase, but largely by collecting; a collection of fossils, almost entirely from the state, partly donated and for the remainder collected; a collection embracing money, historical relics, souvenirs, and promiscuous articles; a collection of fishes, partly from the U. S. Fish Commission, for the remainder collected in the state; a collection of fresh water invertebrates, the results of investigations in fresh water lakes and rivers in the state of Montana; a collection embracing coals, rocks, concentrate samples, building stones, brick, tile and pottery, developed and produced in the state; a set of the series of educational rocks prepared by the U. S. Geological Survey.

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

time during which material has been gathered and the amount expended the collections have made remarkable growth.

The intention is to make the museum a depository of the material representing the natural, mineral and scientific wealth of the state.

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 material in the museum. Time and circumstances are fatal to nearly all specimens, but being properly cared for and placed in the museum of the University they will be preserved.

Correspondence is solicited concerning material which may be donated. All donations will be properly acknowledged, and the articles properly labeled and the donor's name recorded.

The additions to the Museum the past year are as follows:

R. J. Kitching, city, souvenir medal, Paris Exposition, 1883. Souvenir King's Jubilee, Sweden.

California Powder Co., San Francisco, California, samples of all powders manufactured by them, as also of powders no longer made. Samples of cans, fac-similes of their dynamite sticks. All in a handsome hardwood case with glass all round and plate glass shelves.

Mrs. Henry Myers, city, sample of woven glass.

D. R. Beck, city, young apple trees killed by grasshoppers at Nine Mile, fossil wood from the Bitter Root, samples of jasper rock from near Virginia City.

Ina and Rose Fullerton, Red Lodge, three horned toads.

Charles Emsley, city, a collection of about 250 mounted insects from Missoula.

Louisa McDermott, a large amount of material representing the work of the Indian children in the Flathead reservation.

Dr. W. P. Parsons, city, fungus from pine tree.

P. M. Silloway, Lewiston, a collection of 44 sets of bird eggs, mostly with nests, from various parts of the United States.

Missoula Fire Department, fragments from the explosion in Butte in 1895.

W. W. White, Missoula, several rattles from rattlesnakes.

Mr. and Mrs. Morris Akerly, city, vase turned out of pumice stone from Mt. Shasta.

Major A. L. Duncan, city, 53 species of shells from the Philippine Islands.

Charles W. Johnson, city, a mounted peacock.

Charles F. Hedges, Miles City, through the Biological Station, 268 bird skins.

Paul Reinhard, city, a western grebe.

Gilbert Mills, city, several skins of ducks.

Frank Ives, New York Morning Post, November 7, 1783.

Loaned by Harold Blake, implements of war from the Philippines, officer's sword, a bolo and a Ba'iong.

Loaned by Major A. L. Duncan, implements of war from the Philippines, 2 halberds, 3 spears, 2 bows and 5 arrows, 1 flag, 5 swords.

Dr. J. W. Blakenship, Agricultural College, 263 species of Montana plants from the Williams collection.

Biological Station, nearly 500 bird skins; a series of shells, both land and fresh water; 114 vials of entomostraca from the lakes and rivers of the state; several hundred species of plants; a series of insects, not yet mounted; about 250 fish from the lakes and rivers; about 20 mammal skins; about twenty pieces of wood of the state.

W. E. Carroll, Butte, Mont., shell from the "Bloody Angle" battlefield of Gettysburg.

H. Hazelton, city, samples of Calcite and Hornblende from Beaverhead County.

Mrs. C. R. Prescott, two pieces of coral.

Laflin and Rand Powder Co., New York, set of 40 show case vials, showing the various stages of powder making and illustrating the different kinds and grades of powder put upon the market.

Department of Latin and Greek.

This department is supplied with a set of Kiepert's Classical Maps; with Cybulski's colored wall charts; and a carefully chosen selection of lantern slides and mounted photographs for the illustration of Greek and Roman Archaeology and Private Life.

The library is well supplied with the most important and essential works of reference for this department.

School of Mechanical Engineering.

The quarters in Science Hall devoted to Mechanical Engineering consist of the following: Mechanical drawing room and office, on the first floor of the two-story front of the building; wood shop, machine shop, forge shop and foundry, located in the one-story extension of the building; and the engine room, located in the basement under this extension.

The drawing room is a well lighted room, 23x34 feet in size. The office of the Professor of Mechanical Engineering is adjacent to it. Nine drawing tables furnish accommodations for eighteen students. A library of over one hundred volumes of standard works, as well as a large number of engineering catalogues, pamphlets, etc., furnish the student with valuable references.

Passing from the hall of the front part of the building into the one-story extension above referred to, the wood, machine, and forge shops, and foundry, occupy rooms, in the order mentioned. The wood shop is 30x40 feet in size, and is well lighted on both the north and south sides. Work benches with vices and tool cupboards, furnish accommodations for ten students at bench work, while ten lathes of 11-inch swing enable an equal number to engage in wood turning. There is also an excellent wood turning lathe of 16-inch swing and 12-foot bed, with double-ended spindle, for turning large work. A double

circular sawing machine, with cross-cutting and ripsaws, a scroll saw, a wood trimmer and a grindstone complete the equipment of this shop.

The machine shop is adjacent to the wood shop. It is 30 x 27 1-2 feet in size, and is lighted from both north and south sides.

The equipment comprises one 16-inch by 8-foot engine lathe, with taper-turning attachment, chuck, large and small face plates, a 32-inch swing drill press, a sensitive drill, a 16-inch stroke shaper, a power hack saw, a wet emery grinder, a double emery grinder, and benches with four machinist's vises.

The forge shop opens off the machine shop. It is 30 x 30 feet in size. Eight Buffalo down draft forges are placed in this shop, and a Buffalo combination blower and exhaust fan furnishes blast and carries off the smoke. There is also a small portable forge with blower attached. A combination shearing and punching machine, and a complete outfit of anvils, hammers, tongs, and other necessary tools, complete the equipment of this shop.

The foundry also opens off the machine shop. It is a well lighted room, 30 x 30 feet. The equipment consists of a No. 0 Whiting Cupola, a Sturtevant steel pressure blower, core oven, core making bench, and the small tools and supplies needed.

In the machine shop there is partitioned off a small tool room. Here are kept all the small tools, such as calipers, taps, scales, etc., for the machine shop, and also many tools for the wood shop. Also a complete stock of supplies, such as machine and wood screws, sand paper, etc., is conveniently stored. A checking system enables the instructor to give out these tools for students' use, without danger of their being lost or mislaid.

A 50-horse-power Automatic Atlas Engine, located in the basement, furnishes power for the shops. It is expected that this engine will be used in connection with work in steam engineering.

Department of Mathematics.

This department is supplied with an excellent surveying outfit consisting of transit, Y-level, compass, leveling rods, chains, tapes, etc.; with Ross's Dissected Surface Forms and Geometrical Solids; and with other forms and solids part of which have been constructed by students at the University.

The library also contains a number of reference books for the department.

Department of Free-Hand Drawing.

This department has at its disposal two large, well-lighted rooms on the first and basement floors of the University Hall. The upper room is one of the most attractive in the building, the walls being hung with casts so chosen as to afford gradual advancement for the student. They consist of leaves, flowers, and vase forms; parts of the body, as the eye, nose, mouth, hand, and foot; animal heads; and human masques, among which are the following: St. Francis, Voltaire, Cupid of Donatello, the Dying Alexander, Venus de Milos, and Michael Angelo's Slave. In this room is done most of the charcoal and black and white work.

The lower room is used for painting in oils and water colors, and is well suited for the purpose. Its refurnishing with water color tables, stools, and easels makes it an ideal studio.

This department has in equipment in addition to the casts, a set of geometric solids; papier mache reliefs of decorative designs, leaves, flowers, and heads; still life forms of various shapes and colors; and a choice selection of photographs and reference books, helpful in the study of the History of Art.

Collegiate Departments of Instruction.

Note.—Roman numerals indicate the number of the course; Arabic indicate the number of recitations per week. Courses extend through one semester.

Department of History and Economics.

COURSES IN HISTORY.

I. Political and Constitutional History of England. The development of the English Constitution is traced from Anglo-Saxon institutions and the contributions of the Normans. Prominence is given to the study of Magna Charta, the king, barons and commons, the English church, the Stuarts and parliamentary government, the commonwealth, financial policies, taxation, colonization and similar questions.—4.

II. American History. Especial attention is given to the development of political, social and industrial institutions. Intensive study is made of events of national importance. The Spanish in America, the French in the Mississippi valley, the Dutch in New York, the Puritans, the Virginians, territorial expansion, the powers and relations of the Federal and State Governments, slavery, taxation, commercial policy and the tariff, money and banking, etc.—4.

III. Studies in Ancient History, including the Kingdoms of the East, Egyptian Civilization, the Grecian States and the Roman States. The aim is to investigate the social, aesthetic, religious, domestic and political life of these peoples; to discover the motif of their educational, family, ecclesiastical, military and political institutions.—4.

IV. Mediaeval History. A study of a few of the great movements of the Middle Ages. The migration and settlement of the Teutonic Tribes, Mohammed and Saracen Civilization, the Empire of Charlemagne, the Byzantine Empire, rise of the Papal Power, Feudalism, Monasticism, the Crusades, the beginnings of modern European Governments, the growth of cities, etc.—4.

V. Modern European History.—Era of discovery and conquest,

the Reformation, rise of the Dutch Republic, thirty years war, Peter the Great and Russia, Frederick the Great and Prussia, the French Revolution and Napoleon, disturbances of 1830 and 1848. Crimean War, present status of the church and society, constitution of modern European Nations, current problems of trade, the army, finances and Balance of Power.

COURSES IN POLITICAL ECONOMY.

I. The Elements of Political Economy. The subject will be treated from the historical standpoint, and especial attention will be given to those subjects which directly relate to the industrial, social and practical life of the people.

II. Modern Economic and Social Questions. Rise of the Historical School, Modern Socialism, and recent tendencies in legislation.

Department of Philosophy and Education.

COURSES IN PSYCHOLOGY.

I. Descriptive Psychology.—This course presents a systematic view of modern psychology. Attention is given to such topics as the province of psychology, methods of psychological research, the growth of the central nervous system, the relation of mind and body, the nature of consciousness, the phenomena of sensation, etc., as well as a study of the higher intellectual faculties and the will.—4.

II. Experimental Psychology.—This course is open to students who have a knowledge of general psychology. It furnishes a practical exposition of the materials and methods of psychological investigation. The lectures are accompanied by class demonstrations. An opportunity is afforded for individual work in the laboratory which trains the student to carry on original research work. The more valuable experiments are given in visual, auditory, dermal and muscular sensations; color, time and space perceptions; motor reactions and fatigue; tests in attention, memory, association, discrimination, emotion and the will.

COURSES IN THEORY AND ART OF EDUCATION.

I. History of Education.—The aim is to give a comprehensive review of the rise and progress of education. Methods, materials, organization, principles and ideals of education are studied chiefly under the following heads: Athenian and Spartan Education together with the Views of Plato and Aristotle. Roman Education. The Monasteries, Scholasticism and the rise of the Universities. The Renaissance, Humanism and Sturm. The educational system of the Jesuits. The rise of Realism, Comenius and Bacon. Rousseau and education according to nature. The Kindergarten. Pestalozzi and Froebel. Hegel and Herbert Spencer and Spencerism. Education in the United States and Horace Mann.—4.

II. Theory and Practice of Education.—The Statutes of Montana provide that graduates of the University shall be given a life diploma to teach in the state after two years' successful experience of teaching. The aim of this course is to give a prac-

tical training in the theory and art of teaching. Opportunity is given for observation of actual school work. The scope of the work is indicated by the following topics: Qualification and equipment of the teacher. Methods of teaching the various subjects. School management. Supervision and discipline. Programs, courses of study and school organization. School sanitation. The relation of the school and society. Duties of the teacher and his relation to the parents.—4.

COURSES IN PHILOSOPHY.

I. Ethics. Lectures and Recitations. An attempt will be made to apply the scientific method to the investigation of the right of human conduct and individual relation.—2.

II. History of Philosophy, Text-Book and Lectures.—4.

III. An examination of the leading theories in Modern Philosophy, Lectures and Library Work.—4.

Department of Rhetoric and Literature.

COURSES IN RHETORIC.

I. Class room work will be divided between theory and practice. Themes affording practice in narration, exposition, summarizing and argument will be required.

A portion of the time will be devoted to the analysis and study of the oration.

Lectures will be given upon the history of the English language. Four times per week, first semester.

II. Critical reading of selections from prose masterpieces, having in view the verifying of the principles of rhetoric. Essays and papers will be required throughout the course.

Lectures upon the formation and growth of English prose will be reinforced by collateral reading. Second semester.

Open to students who have taken Course I or its equivalent.

COURSES IN LITERATURE.

I. Introductory course to the Study of Shakespeare. A course of lectures giving a general view of the history of English literature from its beginning to the seventeenth century. Selected plays from Peele, Lyly, and Marlowe.

Must be preceded by Course I in Rhetoric. First semester.

II. Shakespearian Drama. The critical study of three representative tragedies. Open to students who have completed Course I, and to students in the Mechanical Engineering Department. Second semester.

III. English Literature of the Eighteenth Century. Lectures and written reports. Special attention will be given to the works of Pope, Goldsmith, Gray, Addison, and Swift. First semester.

IV. English Literature of the Nineteenth Century. Prose—Carlyle, George Eliot, Arnold, Lamb, and Ruskin. Lectures on the literature of the nineteenth century. Second semester.

V. English Literature of the Nineteenth Century.—Poetry. Selections from the verse of Wordsworth and his contemporaries. First semester.

VI. Tennyson and Browning. The critical study of selections

from Tennyson and Browning, comparing the style, philosophical ideas and theories of the authors. Second semester.

VII. American Literature.—A survey of American literary history, and the discussion of notable works in prose. First semester.

VIII. American Literature.—Selections from the verse of the greatest American poets. Second semester.

IX. The extended and critical study of the poems of Browning. Graduate Course.

X. Some department, subject, or figure in Literature will be selected as the basis of the work of this course. Graduate Course.

Department in Chemistry.

COURSES IN CHEMISTRY.

The courses in Chemistry are arranged as nearly as possible like those in the best chemical laboratories in the United States. As an introduction to all courses in this subject, and as a prerequisite for many others, a course extending over two semesters is given in General Chemistry. This is presented by recitations, lectures and laboratory work, and is required of all students in the University. It should be taken in the Freshman year. Ii this year's work students gain a clear conception of chemical elements, chemical changes, and the philosophy of Chemistry in general—principles too often indistinctly learned, but absolutely essential for all future work in this Science. The student will be expected to do a large amount of quantitative work in connection with the laboratory course.

One-half year in Qualitative Analysis follows this work. It is taught by lectures and recitations, but the larger proportion of the student's time is spent in the laboratory. It is expected that another semester will be devoted to Quantitative Analysis which involves the principles of analysis, by both gravimetric and volumetric methods.

These two years of work should be considered as essential for all other work in Chemistry and for advanced work in Mineralogy. It is recommended that Assaying be not taken up until after this amount of work has been finished, although only the first three semesters of work are required.

Advanced courses in Chemistry are taken up at the student's option. At present a course in Organic Chemistry involving lectures and laboratory work on the chemistry of the compounds of carbon is offered for those students fitted for the work.

The course in Physical Chemistry should be taken by all students specializing in either Physics or Chemistry.

Ample apparatus is at the disposal of the students (see equipment), and with the fine laboratories every inducement is offered to students to make themselves proficient in this interesting line of science.

I. General Inorganic Chemistry: Non-Metals.—Required of all students. Open to all students who have no entrance conditions in

Mathematics. Two lectures or recitations per week. Two afternoons of laboratory work. Four hours. First semester.

II. General Inorganic Chemistry: Metals.—A continuation of Course 1. Required of all students. Four hours. Second semester.

III. Qualitative Analysis.—Required of all students specializing in Chemistry, and must be preceded by Courses I and II, or their equivalent in some laboratory of acknowledged standing. One lecture and ten hours of laboratory work. Five hours. First semester.

IV. Quantitative Analysis: Introductory.—Must be preceded by Courses I, II and III. The principles of gravimetric and volumetric analysis are presented in this course. Required of all students specializing in Chemistry, Mineralogy and Assaying. Four afternoons of laboratory work with explanatory lectures. Four hours. Either semester.

V. Assaying: Must be preceded by Courses I and II and if possible by III and IV. Students specializing in Chemistry and Assaying will not be permitted to take this course unless preceded by Course II and Mineralogy and accompanied or preceded by Course III. Includes laboratory work in grinding and sampling ores, and the fire assay for gold, silver, lead and copper, and bullion assay. Determinations involving Volumetric methods, or the so-called wet methods, will be given as part of Courses III or V, depending upon the needs of the student.

Lectures on occurrences of ores, methods of sampling and fluxing for the assays of all of the principal metals will be given. Students desiring to specialize in this work are required to precede the course by Mineralogy.

Text book, Brown's Manual of Assaying. Other standard works, as Ricketts and Miller, Hiorns, Mitchell, and Furman, are in the library. Three afternoons. Second semester.

VI. Mineral Analysis: Systematic.—Quantitative Analysis of representative minerals. Required of all students specializing in Chemistry. Four afternoons. Either semester.

VII. Organic Chemistry.—Lectures and recitations on the Chemistry of the compounds of carbon, including the fatty and the aromatic series. The aim of the course will be to take up very thoroughly the simpler compounds, going with great detail into a study of the relationships and characteristic reactions of the different classes of organic compounds. Remsen's Organic Chemistry is used as a text and Richter's or Bernthsen's Organic Chemistry will be used as a reference book. Must be followed by Course VIII.

Prerequisite: General Chemistry and Qualitative Analysis. (Given in 1900-1901). Two hours. First semester in alternate years.

VIII. Organic Chemistry.—A continuation of Course 7. (Given in 1900-1901). Two hours. Second semester, in alternate years.

IX. Organic Preparations.—Laboratory work. Open in connection with Course VII to students who have completed Course III. (Given in 1900-1901). Two afternoons. First semester, in alternate years.

X. Organic Preparations.—A continuation of Course IX. Open to students who are taking Course VIII. (Given in 1900-1901). Two afternoons. Second semester, in alternate years.

XI. Physical Chemistry.—Lectures, assigned readings and reports. Walker's Introduction to Physical Chemistry is used as a text. Course XI is necessary for all students who wish to acquire more than a very elementary knowledge of chemistry. Must be preceded by Courses I, II and III, and by Courses I and II in Physics. This course will not be given during the year in which courses in Organic Chemistry are offered. Three hours. First semester, alternate years.

XII. Fuels, and the Metallurgy of Iron, Steel, Copper and Lead.—Lectures, assigned readings and reports. Each student will be expected to have a copy of Huntington and McMillan's Metals. Two lectures will be given per week, and each student will be expected to hand in a paper on some practical subject at least once a week. Three hours. First semester, alternate years.

XIII. Industrial Chemistry.—A continuation of Course XII. Will be given only when a sufficient number of students desire to continue the work through this semester. Acid and alkali manufacturing, sugar making and refining, petroleum, etc. Thorp's Industrial Chemistry is used as a reference book. Three hours. Second semester, alternate years.

XIV. Research.—Students having sufficient preparation may investigate special problems in the laboratory. Hours to be arranged.

The department intends to offer special graduate courses in advanced Qualitative Analysis, such as the analysis of water, minerals, etc., and in Inorganic Preparations. Students wishing to take such work should consult the head of the department before the beginning of the school year.

Department of Physics and Geology.

COURSES IN PHYSICS.

This subject is taught by both lectures and laboratory work. In the preparatory courses the students perform nearly all of the experiments after having had the subject presented and explained to them in the recitations.

For the advanced work the subject will be presented also by lectures and laboratory work. In this way the illustrative part of the subject is presented to the student by the lecturer, and the quantitative part is done by the student himself. This arrangement gives the greatest efficiency to the department both for the student and for the professor. The equipment in the way of apparatus is well arranged for both lecture experiments and for physical measurements, while the laboratories are equipped with the modern forms of tables, as described under Equipment.

Course I. College Physics. Mechanics, Sound and Light. Required of all students in Engineering, and in the Scientific Course. Must be preceded by Courses I and II, Preparatory, or their equivalents, and by Mathematics I and II. Not open to freshmen except by special permission. Students conditioned in the required Mathematics may not take this course. Four hours credit, two lectures and two Laboratory periods. Course begins in first semester. Lectures accompanied by experiments of illustrative rather than quantitative nature.

Course II. College Physics, Heat, Electricity and Magnetism. Second semester. A continuation of Course I, and cannot be taken independently of that course. Four hours.

Course III. Electrical Measurements, Testing of Electrical Instruments, and the determination of various Electrical Constants, etc. Lectures and Leboratory work. Three hours. Second semester. Required of Engineers.

Course IV. Advanced Experimental Physics. Hours to be taken, optional with the student, but not less than two hours may be taken. May be taken during either or both semesters. Must be preceded by Courses I and II.

COURSES IN GEOLOGY AND MINERALOGY.

At present this work is included in one Department and all courses offered are elective. The subjects treated will be general work in Mineralogy and Petrography, and in Dynamic Geology and Physical Geography. Courses in Paleontology and Stratigraphic Geology will be given and the subjects will receive treatment as a part of Dynamic Geology. This region offers unsurpassed opportunities for study of the many and varied processes and geological changes and a wonderful diversity of different geological formations, while the State of Montana and neighboring states are noted for the large number of crystallized minerals found within their borders. As these states are distinctively mining states, all must realize the importance of a thorough knowledge of the principles of Mineralogy and Geology as applied to ores of economic importance. Special attentiin is given to Economic Geology after the students have prepared themselves in the fields of these two sciences.

The subjects are taught by lectures and laboratory work. For Mineralogy and Lithology the laboratory work is the examination of the minerals in museum (see museum), and the determination of minerals by megascopic and blow-pipe tests. For Geology the laboratory work is applied as field work and excursions to the different exposures of characteristic rocks, and to localities where important geological changes have taken place and left their trace.

Course I. Mineralogy. A study of the minerals from their crystallographic and chemical properties. Susject of Crystallography thoroughly reviewed before the study of minerals is taken up. Must be preceded by Chemistry I and II. The following courses are recommended as precedents, or to accompany this work: Chemistry III, Mathematics I and II, and Physics I and II. Students deficient in preparatory Mathematics or Physics may not take this course. Four hours credit. Two lectures or recitations, and two laboratory practices. This latter work will include an introduction to blow-pipe analysis which will be studied during the latter portion of the term.

Course II. General Geology. Text book and lectures accompanied by field and laboratory work. Four hours distributed between lectures and field work like course in Mineralogy. Especial attention is given to Dynamic Geology, but Physical Geography is also fully treated. Must be preceded by one course of College work in Science. First semester.

Course III. Historical Geology. Continuation of Course II. In

addition to the regular lectures and field work there will be an examination of the most familiar fossils and the determination of 150 common rocks and minerals. Second semester. Four hours.

Course IV. Lithology. A study of rocks from their physical and chemical properties without the use of the microscope. Particular attention is paid ot their mineralogical composition. Must be preceded by Courses I and II. Second semester. Four hours credit. Two lectures and two laboratory practices.

Course V. Economic Geology. Deals with the minerals of gold, silver, copper, lead, iron, zinc, antimony, etc., which occur in quantities of economic importance, modes of occurrence of same, and effect of different gangues on values of ores. Must be preceded by Courses I and II. First semester. Four hours, lectures and field work. Trips to mines and mills will be expected.

Course VI. Blow-pipe Analysis. Second semester. A continuation of work in determinative mineralogy. Laboratory work only. Credit one or two hours.

Course VII. Invertebrate Paleontology. A more complete study of Historical Geology, with special attention paid to Montana fossils. First or second semester. Lectures and Laboratory work. Two hours credit.

Department of Biology.

This department offers elementary work in general Biology looking toward a specialization either in Botany, Zoology or Microscopy, with advanced work in some lines in either of these three subjects. The rooms for the use of the department are on the first floor and in the basement of University Hall, are commodious and well-lighted, and offer ample facilities for present needs. The material equipment is given elsewhere in this catalogue under the head of equipment.

Th collections of working material are being constantly augmented. In addition to those mentioned under the head Museum there is a good series of marine alcoholics, containing both vertebrates and invertebrates, and a good collection of alcoholics from this region. For comparison in elementary work there is a collection of several thousand mounted slides, additions being constantly made. The University is situated under the shadow of Sentinel Mountain, altitude 6,000 feet, is within a short distance of Missoula River, is but a few miles from the Bitter Root River, and is in the famous Missoula Valley, an agricultural region of great fertility. A few miles away Mt. Lo Lo rises to an altitude of 9,500 feet. The opportunities botanically and zoologically are excellent.

The aim of the department is to bring the student into direct contact with the truths of nature. To do this there are lectures and recitations to give broad and general views, while in the laboratory each student is taught to get the facts for himself first hand. The rich and new field in which the University is located gives students good opportunity for work.

It is the intention of the State Board of Education to make the work of the University as nearly free to residents of the State of Montana as possible. In carrying out this generous plan there are no laboratory fees. The student makes a deposit to cover breakage only. At the close of the semester the balance is returned.

To carry on the work of the department a knowledge of Latin or Greek will be found of great advantage. In all courses an ability to draw well free hand is anticipated, while a knowledge of German and French is very desirable, and for research work indispensable.

In all laboratory work of the department the students work individually at separate tables. Each student is supplied with microscope, glassware, and necessary apparatus, the material being kept in the drawer space of the table . The material is charged to the student and he is held accountable for it. At the close of the semester when the material is returned, in good order, he is credited with the amount returned. Every facility is offered students for successful work in the courses outlined.

The tables have been planned specially for the work to be done upon them. The tops are of oak, stained and paraffined. They are low enough for students to work with microscope vertical, giving all the comfort possible with the least fatigue. There is abundant drawer space for drawings, notes, glassware, etc. The beginners and advanced students work in separate rooms.

A nucleus of a department library has been made, and the library facilities are being increased yearly. Several hundred volumes and pamphlets have been loaned by the professor for departmental use. The university is adding to the library facilities as rapidly as funds will permit. The literature in a few special lines is somewhat extensive.

The following courses are offered for the year 1901-1902; for the year of required Biology the student may take Courses I and II, or V and VI.

COURSES IN BIOLOGY.

Course I. General Biology. An introduction to the study of living things. It is designed to illustrate by the study of a few organisms the fundamental structure and properties of living matter. A series of animal and vegetable forms is studied in the laboratory, to harmonize with recitations. Two recitations and five hours of laboratory per week. First semester. Required of all students. Four hours credit.

In this course Parker's Biology was used the past year. The students have each a microscope and all necessary material for work. The dissections include Amoeba, Paramecium, Haematococcus, Diatom, Vorticella, Hydroid, Aurelia, Mucor, Penicillium, Yeast, Earthworm, Starfish, Lobster, Dogfish. Each student prepared and mounted a series of about seventy-five slides and was taught to embed in parafine and use the microtome. To aid in the work reference was made to such works as Marshall and Hurst's Zoology, Brooks' Invertebrate Zoology, Bumpus's Invertebrate Zoology, Dodge's Elementary Biology, Colton's Zoology, Huxley and Martin's Biology, Howes' Atlas of Biology, etc.

At the close of the work of the semester a thesis is written on some approved subject, and presented for criticism. Accurate drawings are required, which are handed in from time to time for inspection.

Course II. General Biology. Continuation of Course I, and necessary for the completion of the work therein indicated. Second semester. Required of all students. Four hours credit.

At the beginning of this course the students are given a series of lectures, covering a period of about six weeks, on such topics as are of general interest, mainly in connection with the work in progress, and suggested by the work as it proceeded. Students are required to take notes, to write up the lectures in their own language, and are examined on what has been presented. The lectures are made as practical as possible, and have proven of great value as indicating what is being done in the subject, the theories advanced, what investigations are in progress, and the field for study yet untouched.

Course III. Invertebrate Zoology. A general course in the morphology and classification of Invertebrates. Laboratory and Class Work. Dissection of typical invertebrates, such as Grantia, Leucosolenia, Metridium, Pennaria, Campanularia, Sea-Urchin, Sea-Cucumber, Star-fish, Squid, Lobster, Earthworm, Nereis, Phascolosoma, King Crab, Clam, and Insects. In this as in other work in the department, accurate drawings are required. At the close of the semester a thesis is presented, written on some topic in connection with the work. During the study constant reference is made to such works as Packard, Claus and Sedgwick, Huxley, and Lang. The dissections are from the list of laboratory books referred to under Course I, with others. A fair portion of the time is devoted to the laboratory technique, and each student mounts a series of slides from some of the specimens as the work progresses.

Lectures or recitations occur twice per week. In the latter Thomson's Outlines are taken as a basis for study. First semester. Four hours credit. Elective.

Course IV. A continuation of Course III. Vertebrate Zoology. The dissections include Balanoglossus, Amphioxus, Trout, Frog, Cat, etc. Second semester, elective.

Course V. Structural Botany. In this course the plan is to give an intelligent idea of the scope of modern Botany. Recitation twice and laboratory practice five hours per week. Bessey's Briefer Course is used, with reference to other works on the subject. In addition to the general exercises as given in the text the student studies such types as Spirogyra, Diatoms, Protococcus, Mucor, Agaricus, Moss and Fern, and a flowering plant, using such laboratory gudies as Arthur, Barnes and Coulter's Plant Dissection, Dodge's

Elementary Biology, Huxley's Biology, etc. Each student is supplied with a microscope and all necessary reagents, is taught to use the camera lucida and measure with a micrometer scale, and to prepare material for the microtome. First semester. Four hours credit.

Course VI. Systematic Botany. To be preceded by Course V. The region near the University has a rich flora, of great botanical interest. The valley has an altitude of 3,225 feet above the sea, and plants may be had from this height to 9,500 feet, the height of Mt. Lo Lo some miles distant. This Course and Course V may be taken at any time without previous biological study. Laboratory and field work, with lectures. Second semester. Four hours credit.

Course VII. Microscopy. Laboratory work with occasional lectures. A course in microscopical technique, on histological subjects. Students entering must have taken sufficient chemistry to work intelligently with various stains, reagents, and other chemicals. Different methods of hardening, sectioning, and staining histological material will be studied. This course will be given either semester, and may be taken for either a two or four hour credit. Elective.

Courses VIII and IX. Special Work. Under this heading additional study along biological lines will be outlined for students desiring it, considering both the demands of the students and the capacity of the department for carrying on the work. Special subjects will be assigned under the following heads: Entomology or ornithology within certain limits, physiology with special reference to the histology of the human body, or investigate work on limited groups of animals or plants. Those entering this work must have finished four of the preceding courses, and must have a reading knowledge of French or German. Laboratory work, ten hours per week for four hours credit, or twelve and one-half hours for five hours credit, with work in Seminary. Only students of special fitness will be admitted. They will be encouraged to take up some of the problems which the new field of work about the University presents, and will be offered every facility which the laboratory can afford, and will be given free use of the material collected from the region. Elective, either semester.

Course X. Photography. The camera is such an invaluable aid in all lines of scientific work that a course of work has been laid out which will be carried on conjointly by the departments of Chemistry and Physics and Biology. The former will take the theoretical side, with lectures on lenses, developers, and chemicals, the latter the practical work in the field and dark room. The course will consist of one lecture and one laboratory practice per week, with two hours credit. Elective, first semester.

Course XI. A continuation of course ten, devoted to the practical use of the camera in scientific work. Instruction will be given in making lantern slides, transparencies and bromide enlargements. Negatives will be made of scientific objects and groups of objects. Copies of important photographs will be made. Photomicrography will be a prominent feature. Laboratory, five hours per week, two hours credit. Second semester. Elective.

Course XII. Entomology. A course in systematic entomology; a study of the anatomy and morphology of insects, followed by systematic study of the different orders and families, with use of keys for determination of species. Comstock's Insect Life is the basis for determination of orders and families. Various works will be used for the specific determinations. Special attention will be given to injurious insects, with means employed for their control. One lecture and five hours of Laboratory per week. Three hours credit. Second semester. Elective.

Course XIII. A study in Variation. For graduate students. Problems in variation as presented by the region and illustrated by laboratory material will be assigned individual students for orginal investigation. Largely Laboratory work, with occasional lectures.

Course XIV. A study in Ecology. For graduate students. Work and hours to be arranged.

Course XV. Histology, with special reference to the human body. Including study of blood, investigations relative to nervous tissue, with experiments, and study of pathological tissue. For graduate students.

Seminary. Advanced students will meet once per week at an hour to be agreed upon, to make reports of work or investigations. Occasional theses will be presented for discussion, as also reports on current literature.

In addition to the courses here offered students are referred to the description of the work of the Biological Station, carried on under the direction of the Professor of Biology. The courses of summer work are open to all who may choose to attend, and credit on the university record is given for the amount of work satisfactorily completed during this summer.

DEPARTMENT LIBRARY.

In addition to the publications mentioned under equipment, the following publications are at the disposal of the student:

Nature.
Popular Science Monthly.
Psyche.

Entomological News.
American Monthly Microscopical Journal.
Journal of Applied Microscopy.
Zoologischer Anzeiger.
Annals and Magazine of Natural History.
American Naturalist.
Botanical Gazette.
Zeitschrift fur Microscopie.
Science.
Journal of Morphology.
Journal of Neurology.
Bird Lore.

The Department of Latin and Greek.

GENERAL INFORMATION.

1. The primary aims of this department are the acquisition of such a mastery of the languages as to enable the student to read them with some degree of facility, to read the greatest possible amount of the best Greek and Roman literature, and to make the work subservient to general culture in the English language and literature.

The scope of this department is conceived to include, not only the study of the language and literature of the ancient Greeks and Romans, as narrowly defined, but also some attention to all phases of their civilization. Without this broader view, some of the most important results of classical studies cannot be attained. For this reason, the study of the arts, institutions, and life of the Greeks and Romans will be given due prominence; and provision has been made for this part of the work.

2. In the required courses, the study of grammar will be pursued in connection with the reading, not as an end in itself, but as a means of intelligently reading the language, with or without translation. The more systematic and scientific study of grammar will be provided for in elective courses.

3. In connection with the prose reading, exercises in writing Latin and Greek will be used. The training in syntax will be largely given in connection with this work.

4. There will be almost daily practice in reading and translating at sight, generally from that portion of the text assigned for the next day's reading.

5. "Bennett's Latin Grammar" and "Hadley-Allen's Greek Grammar" will be used for the ordinary class room work. Editions of the texts will be chosen as far as possible from those which have references to these grammars. Students are advised to bring with them any Latin and Greek text books they may have, but not to purchase books before definite directions are given. The most essential aids for study, such as maps, charts, and works of reference, are provided by the University.

6. The work of the college courses outlined below will be advanced as fast as it seems practicable to advance the require-

ments for admission, and should not be regarded as presenting the ultimate standard or ideal.

COURSES IN LATIN.

I. Vergil's Aeneid—First three books. Elements of Prosody. 4.

II. Vergil's Aeneid—Books IV., V., and VI. 4.

III. Horace—First half, selected odes. 4.
Cicero—Second half, Essays, Letters.

IV. Livy and Tacitus—Selections. 4.

V. Plautus and Terence—One play from each.

VI. Private Life of the Romans. Descriptive, no knowledge of Latin required for this course, open to all students. 4.

This course is given in the second semester and should be preceded by the course in Greek life.

VII. Rapid Reading Course, selected from Latin Poetry. 4.

VIII. Rapid Reading Course, selected from Latin Prose. 4.

COURSES IN GREEK.

I. A First Greek Book: elements of Greek Grammar. 4.

II. First Book of Anabasis: sight reading, writing Greek; study of Grammar in connection with the reading and writing. 4.

III. Anabasis continued; sight reading; writing Greek; Grammar with topical outlines. 4.

IV. Homer's Iliad, selections. 4.

V. Homer continued—First half, selections from Odyssey. 4.
Herodotus and Thucydides—Second half, selections.

VI. Plato—First half, selections. 4.
Demosthenes—Second half, selections.

VII. Greek Dramatists—One play each from Aeschylus, Sophocles, and Euripides, selections from Aristophanes. 4.

VIII. Greek Archaeology, elective in first semester of Senior Year, open to all students. 3.

IX. Private Life of Greeks—Descriptive, no knowledge of Greek required for this course, open to all students, given in first semester.

Department of Mathematics.

All students are required to take one course in Mathematics. Students in Scientific Course must take Courses I and II. In addition to these, students in Engineering Course are required to take Courses III, IV, and V. Students in Classical Course or the Course in Letters may choose between Courses I and II.

Courses not required are open to all students as electives, but must be taken in the order prescribed under Courses in Mathematics.

COURSES IN MATHEMATICS.

I. Trigonometry. First semester. 4.

II. Higher Algebra; Ratio; Proportion; Variation; Binomial Theorem; Arithmetic, Geometric, and Harmonic Progressions; Permutations and Combinations; Undetermined Co-efficients; Summations of Series; Higher Equations. Second semester. 4.

III. Analytical Geometry. First semester. 4. Must be preceded by Courses I and II.

IV. Differential and Integral Calculus. Second semester. 3. When required, must be preceded by Courses I, II, and III. If elected may be taken after Courses I and II.

V. Differential and Integral Calculus. First semester. 3. Must be preceded by Course IV.

VI. Elective Geometry. Devoted entirely to original work. Either semester. 1. May be taken by any one who has passed the entrance requirements in Mathematics.

VII. Elective Geometry. Devoted entirely to original work. Either semester. 1. Must be preceded by Course VI or its equivalent.

VIII. Plane Surveying. Second semester. 2. Must be preceded by Courses I and II.

IX. Differential Equations. Second semester. 2. Elementary Course. Must be preceded by Course V.

X. Advanced Analytic Geometry. Second semester. 4. Must be preceded by Courses III, IV, and V.

Department of Modern Languages.

GENERAL INFORMATION.

The aim of the beginning year of the Modern Language Courses is to give the student a thorough knowledge of grammar; to this is added reading of easy prose; this is followed in the second year with syntax and intermediate readings, the translation of scientific (biological, chemical), and technical monographs. Writing short essays in the languages will be required during the year, and some conversation will be given. In the third year, which is elective, more difficult readers will be used, such as "Faust" or "Wallenstein" in German; "Esther, Athalie," Moliere in French, and Cervantes in Spanish.

During the third year conversation and composition will be made one of the chief aims of instruction. Extracts from modern authors will be read, and the study of the literatures will be made a special topic.

Tests will be given in the different classes from time to time. Elective classes will be organized only upon the application of three or more students for the work.

Recitations are held four times per week.

If time permits classes will be organized purely conversational.

GERMAN.

A course of three years has been planned. During the first and second Course I, II, III, IV, Joyne's Meissner's Grammar will be used and Joyne's Reader, followed by a course of reading. 'Peter Schlemihl," Wilhelm Tell, etc.

The third year (Courses V and VI) will be devoted to a study of the classics, some of Schiller's and Goethe's works, as Schiller's Ballads, and Goethe's Faust, Part I and scientific monographs. These latter will be given to those students taking the Scientific Course. Essays will be required in the various subjects which students are pursuing. such as chemical, biological, etc.; also—Wenkebach's Deutsche Literatur Geschichte.

FRENCH.

Courses I and II devoted to the study of Chardenal's Complete French Course. Reading (Daudet, 3 contes), followed by Courses III and IV, consisting of intermediate readings, such as Colomba, translations of various selections from modern writers, with exercises in composition and conversation, followed by Courses V and VI (Elective), which will be devoted to a study of the French classics and scientific writings, and Duval's—Histoire de la Literature Francaise.

SPANISH.

A three years elective course will be given if called for. The first year, or Courses I and II, will be taken up with the study of Grammar and very easy readings from modern prose, followed by Courses III and IV, which will be devoted to readings of Spanish classics and literature; Syntax. Exercises in composition and conversation will be given.

A third year, or Courses V and VI, will be continuation of Courses III and IV. Conversation and composition; recitations will be held in Spanish.

Department of Free-Hand Drawing.

The purpose of this department is not only to give thorough and systematic instruction in Drawing and Painting, but also to instill the aesthetic taste and refinement that attend a true appreciation of art.

The arrangement of the courses follows the general trend of the best art schools. Care is taken that the work does not become narrow and mechanical, the desire being to attain freedom and breadth of understanding and execution.

One year of Free-hand Drawing is required of all students. Two and a half hours, twice per week, are devoted to the work.

The first semester's work serves as an introduction into the subject. A variety of exercises is given to develop correct seeing and facility of execution. The fundamental principles of perspective are taught, not theoretically, but from groups of objects and room interiors; value in light and shade is obtained from still life studies; and precision of line from pen and ink work.

In the second semester charcoal work is taken up. The student begins drawing from simple casts of plant life and fragments of the human body and gradually advances to antique heads. Sketching in pen and ink and sepia is also done.

For those that wish to devote more time to the subject two more years of work are given as free electives. In these courses the student may devote two and a half or four hours per week, and will be given credit according to the time spent. It is the desire to afford as much freedom and exercise of individual taste as is consistent with thorough work.

In courses III and IV (taken in the first elective year) some charcoal work and the antique is required. Besides this a choice of three lines of work is offered; watercolor, oil, and black and white work. In the black and white work, crayon sauce, pen and ink, and wash blacks are the mediums used, and the work leads to illustration. Occasionally quick sketches are made from the draped figure, the models being members of the class.

In Courses V and VI (taken in the second elective year) the student pursues more advanced work in any of the lines men-

tioned above. He draws and paints from the draped figure, models being furnished by members of the class, studies composition, and, when the weather permits, sketches and paints from landscape.

Informal talks on perspective, anatomy, and methods are given from time to time.

Two courses are offered in the History of Art. Course VII, given in the first semester, is devoted to the History of Architecture and Sculpture. Course VIII, given in the second semester, takes up the History of Painting. The work consists of lecture and of recitations from the text-book. A number of reproductions, photographs and reference books furnish adequate illustrative and research material.

COURSES IN DRAWING AND PAINTING.

Course I. Required. 2.

1. Drawing in outline and light and shade from geometric solids.
2. Drawing in outline from reliefs of decorative designs, leaves, flowers, and heads.
3. Drawing in pen and ink.
4. Drawing in outline from single pieces of furniture, and from interiors of rooms.

Course II. Required. 2.

1. Drawing in charcoal from the cast; hands, feet, heads, etc.
2. Drawing in sepia from the interiors of rooms.
3. Drawing in pen and ink.
4. Drawing in red crayon.

Courses III and IV. Elective. 2 or 4.

1. Drawing in charcoal from the cast.
2. Painting oil or water colors, or black and white work.
3. Quick sketching from life.

Courses V and VI. Elective. 2 or 4.

1. More advanced work in oil painting, water colors, or black and white work.
2. Drawing and painting from the draped model.
3. Sketching and painting from landscape.

Course VII. Elective. 2.

History of Architecture and Sculpture.

Course VIII. Elective. 2.

History of Painting.

School of Mechanical Engineering.

It is the purpose of this department to give the student a thorough training in those branches of science that underlie the profession of Mechanical Engineering, as well as technical instruction in the practical lines of shop practice, mechanical drawing, and machine design.

Below is given the special work required in this department. For the general work, and for the arrangement of the work according to years, see the Course of Study of the Mechanical Engineering Course. *The hours per week given are the number of hours credit, each one of which requires one hour's work in recitation or lecture, or two and one-half hours in laboratory, shop or drawing room.*

SHOP WORK.

Instruction in shop work is given in the afternoon throughout the Freshman, Sophomore and Junior years. There are three shop periods per week of three hours each.

FRESHMAN SHOP WORK.—During the first semester attention is given to acquiring a knowledge of the use and care of the tools in this shop. A systematic course of exercises has been laid out to accomplish this, involving the use of the tools at the disposal of the student. On the bench, the exercises in carpentry consist of sawing, planing, joining, splicing, mortising, dovetailing, framing and paneling. On the lathes exercise is given in turning of cylinders, cones, beads, ogee curves, etc., and in chucking and face turning. The last four weeks of this semester will be devoted to pattern making.

In the second semester pattern making is continued. This work consists in making patterns of machine parts, and also core boxes for the same should they be required. The making of patterns involves a knowledge of both lathe and carpentry work and requires careful and accurate workmanship. A portion of the time in this semester is given to molding and casting. This work is designed to give a general knowledge of foundry practice, and includes making of molds in green sand, core making, and charging and operating the cupola furnace.

SOPHOMORE SHOP WORK.—Molding and casting is continued for the first six weeks, and is followed by twelve weeks of iron and steel forging. Exercises in drawing out, upsetting, welding, punching, and forming, are followed by a course in steel working and the forging and tempering of tools.

The second semester's work is in the machine shop. The work consists, first, of exercises in vise work, involving practice in the use of hammer and cold chisel, file and scraper; and second, of exercises designed to give practice in the working of the various machine tools. The preliminary exercises are followed by work on complete machines.

JUNIOR SHOP WORK.—During the year, machine shop practice is continued, two afternoons per week. It is the intention to give additional practice in the use of the lathe, shaper, and other machine tools, and to include the building of various machines.

DRAWING.

FRESHMEN DRAWING.—Throughout the year instruction is given in free-hand drawing from models and objects and also in mechanical drawing. The work in the latter during the first semester (Course I) includes lettering, symbolic cross-hatching, line shading, drawing from copy, and orthographic projection. In the second semester (Course II) drawings to scale are made of simple machines and machine parts. Three hours per week.

SOPHOMORE DRAWING.—The work in Mechanical Drawing is continued throughout the year. Complete sets of working drawings are made of existing machines. The necessary sketches and measurements are first made thus gaining additional training in free-hand drawing, and from these sketches the finished drawing is made. One semester three hours, and one semester two hours per week.

JUNIOR DRAWING.—Elementary Machine Design. This work consists of the designing of such elementary machine parts as fastenings, riveted joints, keys, journals, bearings, etc. Both rational and empirical formulas are used, and standard authorities are consulted. In the latter part of the year the work in steam engine design is commenced. A series of ideal indicator diagrams are drawn and combined with diagrams of acceleration force, so as to give diagrams of actual force transmitted to crosshead and crank pin. Two semesters, three hours per week.

SENIOR DRAWING.—Steam engine design. The construction of the preliminary diagrams described under Junior Drawing, is followed by calculations as to weight of reciprocating parts, counter

balance weight, and flywheel. The valve gear, shaft governor and other parts are designed, and complete working drawings prepared. One semester, two hours per week.

Advanced Machine Design. The design of various machines, such as machine tools, boilers, etc., the same general methods being pursued as described in the preceding paragraph. One semester, four hours per week.

RECITATION AND LECTURE ROOM.

WOOD WORKING TOOLS.—Fourteen weeks, one hour per week. Instruction is given in the use and care of wood working tools, and on the elements of wood construction. This course supplements the work of the wood shop.

LECTURES IN PATTERN MAKING AND FOUNDRY PRACTICE.—Twenty-two weeks, one hour per week. The elements of pattern making are given, followed by descriptions of a variety of representative pieces of pattern construction. Instruction is given in simple molding, and in care and management of the cupola and other foundry appliances.

LECTURES IN MACHINE SHOP PRACTICE.—One semester, one hour per week. The use of tools, such as hammers, cold chisel and file, are discussed. The engine lathe and other machine tools are described, and various shop processes and operations are given, the purpose being to give the student such knowledge of shop practice as would be most likely to be useful in his future work.

DESCRIPTIVE GEOMETRY.—One semester, four hours per week, recitation and drawing. Woolf's Descriptive Geometry is used. The correct representation of the point, line, plane and solid in space; sections and intersections of various geometrical figures.

KINEMATICS.—One semester, three hours per week. Recitation and drawing. Stahl and Woods Elements of Mechanism is used. A study is made of the motions transmitted by chains of mechanism, velocity ratios in link work, curves of gear teeth, cams, straight line motions, and various mechanical movements.

Analytical Mechanics. Bowser's Analytical Mechanics is used. One semester, three times per week.

VALVE GEARS.—One semester, once a week. Special attention will be given to study of the plain slide valve, Zeuner's valve diagram being used in the solution of problems. Work of the class room will be supplemented by work in the drawing room.

THEORY OF THE STEAM ENGINE AND STEAM BOILER. One semester, four hours per week. Holmes' Steam Engine will

form the basis for this work. The Mechanics of the steam engine is studied. Also, the thermo-dynamics of the subject. Indicator diagrams, and the theory of compounding, receive attention.

The steam boiler is studied, first, as regards correct design for strength, efficiency, and durability; second, as regards boiler management, inspection, the prevention and removal of scale, firing, smoke prevention, etc.; and third, wear and tear, corrosion, steam boiler explosions.

THERMODYNAMICS OF THE STEAM ENGINE. One semester, three hours per week. Peabody's Thermodynamics is used. A complete discussion of the properties of gases and vapors, with special reference to its application in the steam and other heat engines. The fundamental laws of thermodynamics, efficiency of the perfect heat engine, the solution of practical problems, and the discussion of data from steam engine tests, are some of the features of this work.

STRENGTH OF MATERIALS. One semester, four hours per week. Merriman's Mechanics of Materials is the text used. The work consists of a study of the stresses existing in engineering structures, and the proper stresses allowable under various conditions.. Simple and continuous beams are analyzed, and numerous practical problems are solved.

GRAPHICAL STATICS. One semester, twice per week. The text used will be Volume I of Greene's Graphics. Work in recitation and drawing room, consisting of the analysis by graphical means of the stresses in the various members of framed structures, such as roof trusses.

MEASUREMENT AND TRANSMISSION OF POWER. Lectures, twice per week, one semester. Discussion of the various methods of transmitting power over long and short distances, and the efficiencies of different systems.

ENGINEERING LABORATORY. One semester, twice per week. Work in engine or boiler room, or in shop, performing various experiments with such apparatus as is available.

ELECTRICAL ENGINEERING. One semester, three times per week. This course is designed to give an insight into the principles upon which are based the construction and operation of dynamo-electric machinery.

HYDRAULICS. One semester, two hours per week. Merriman's Hydraulics is used as text book.

Department of Music.

MRS. BLANCHE WHITAKER, DIRECTOR.

The Department of Music of the University of Montana provides instruction in vocal and instrumental music and opportunities for the study of chorus work.

One of the principal features is the Pianoforte School, which is in a very satisfactory and encouraging condition, both as regards number of students and their proficiency. The school is divided into Upper and Lower, and each of these again into two grades, Senior and Junior. The Juniors of the Lower School use as studies the New England Conservatory Method, Bertini's, Czerny's or Heller's Easier Exercises, little pieces by Bach, Reinecke, Gurlitt and others.

The Seniors continue the above with scales in similar and contrary motion, and major arpeggios of the common chord. More advanced pieces given.

In the Upper School the work of the Junior Grade comprises scales in thirds, sixths and tenths, similar and contrary motion, major and minor common chord arpeggios. Cramer's Etudes, Czerny's Virtuosen Schule, and Clementi's Gradus ad Parnassum. The Senior Grade, in addition to the above, takes Arpeggios of the Dominant and Diminished Sevenths and studies by Chopin, Henself, Moscheles and others.

There will be classes formed for sight reading, elementary harmony, musical form and literature.

The standard set is both high and conscientious, and the students are already showing in a very gratifying manner the result of the training received.

Public recitals are given at least three times during the University year, and are of great benefit to the students, both in encouraging exactness and overcoming nervousness.

The piano used in the assembly room of University Hall is the gift of the manufacturer, Mr. George P. Bent, of Chicago, Ill.

As it becomes financially possible concerts will be given by artists of distinction and these will be open to the general public, students receiving tickets at reduced rates.

TERMS.

The fees for this department are payable monthly, and no deductions are made for lessons missed unless due notice has been received and a reasonable excuse tendered.

Lower School, two lessons weekly.....$4.00 per month
Upper School, two lessons weekly .....$6.00 per month

VOCAL DEPARTMENT.

MISS GRACE HERNDON, INSTRUCTOR.

The Italian method of singing is taught in this department, the exercises used for voice placing being those of M. Sbriglia of Paris.

Miss Herndon is a pupil of Marescalchi and also of Mrs. Lathrop, one of Sabriglia's best known representatives in America.

Tone placing to give ease in the use of the voice, with a pure quality and natural registration, and training in natural breathing and correct position are the first work in the course. Careful attention is given to correct enunciation. The vocalises used are those of Concone and Marchesi, the latter sung in Italian, in which language instruction is given.

Music of greater or less difficulty is selected for pupils according to their ability, and a repertoire of high grade songs acquired. The frequent musicales give opportunity for public appearance.

TERMS.

The fees are payable monthly and no deduction is made for lessons missed.

Upper School, two lessons per week.....$6.00
Lower School, two lessons per week.....$4.00
Single lessons $1.00

Collegiate Courses of Study.

The University offers the following general courses of instruction:

A.—A classical course, leading to the degree of A. B.

B.—A course in letters leading to the degree of A. B.

C.—A Science course, leading to the degree of B. S.

D.—A course in Mechanical Engineering leading to the degree of B. S. in Mechanical Engineering.

The work of the year is divided into two equal semesters. For convenience in classification, the work of each department of study is divided into courses and fractional courses. One course means the equivalent of one hour's lecture or recitation four times a week for one semester. Two and one-half hours of laboratory work, shop work, or drawing counts the same as one of the lecture or of recitation. At least thirty-two full courses as here defined are required for graduation. A student's choice of elective work is subject to the approval of the Faculty, which reserves the right of refusing to give any elective course for which there are less than three approved applicants.

ADMISSION TO COLLEGIATE COURSES.

Candidates for admission to the Freshman class in any of the collegiate courses of the University, must be at least sixteen years old and present evidences of good moral character.

Students coming from other colleges and universities must bring certificates of honorable dismissal.

Admission may be made:

(a)—By certificate.

1. Graduates of the accredited High Schools of Montana are admitted to the Collegiate Departments of the University on presentation of their Diplomas accompanied by a certificate from the Superintendent of their respective schools.

2. Students coming from any other school or college are requested to bring all grade cards, certificates or diplomas that they may possess, together with written statements from teach-

ers, superintendents or principals, in order that a proper estimate may be had of their past work.

(b)—By examination.

Examinations for entrance will be given on days set in calendar of this catalogue.

Preparation is required or may be presented in the following subjects:

1. Algebra. Fundamental operations (including special rules for Multiplication and Division); Factoring; Highest Common Factor; Lowest Common Multiple; Equations of the First Degree containing one or more unknown quantities (including problems in the same); Involution and Evolution; Fractional and Negative Exponents; Radicals; Quadratic Equations of one or two unknown quantities. The equivalent of Chapters I—XVII, XIX and XX of Wentworth's New School Algebra.

II. Geometry. Plane and Solid. Demonstrations, construction and the solution of numerical problems involving the metric system and logarithms. The equivalent of Wentworth's text and Estill's Numerical Problems in Plane Geometry.

III. Engilsh Language and Literature.

The requirements are:—

1. Grammar. A good knowledge of the elements of grammar, including the parts and properties of speech, the various kinds of sentences as to form and meaning, parsing, sentential analysis, and the classification of the elements of sentences.

2. Composition and Rhetoric. Ability to write clear and idiomatic English, and make practical use of the essentials of Rhetoric, not only form, construction, syntax and punctuation, but also the principles of good style and rhetorical figures.

3. Literature. Applicants will be expected to be familiar with the form and substance of the works in group (a), and to possess a general knowledge of the subject matter in group (b).

For 1901. (a) Shakespeare's Merchant of Venice and Macbeth, Milton's Paradise Lost, Books I and II, Burke's Speech on Conciliation with America, Macauley's Essay on Milton, Macauley's Essay on Addison. (b) Tennyson's The Princess. DeQuincey's Flight of a Tartar Tribe. The Sir Roger de Coverly Papers, Pope's Translation of the Iliad, Dryden's Palamon and Arcite.

For 1902. (a) Shakespeare's Macbeth and Merchant of Venice, Milton's Minor Poems, Burke's Speech on Conciliation with America, Carlyle's Essay on Burns, Macauley's Essay on Milton and Macauley's Essay on Addison.

(b) Tennyson's The Princess, DeQuincey's Flight of a Tartar Tribe, Addison's Sir Roger de Coverly Papers, Pope's Translation of the Iliad. Scott's Ivanhoe and Goldsmith's Vicar of Wakefield.

IV. History. Ancient History, the equivalent of one year's work, with special reference to Rome.

V. History. Modern History, the equivalent of one year's work, with special reference to England, France, and the United States of America.

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

VII. Latin. The reading of four books of Caesar, and four orations of Cicero, or their equivalents, with the grammatical knowledge which must be acquired in the preparation for and performance in a thorough manner of this reading. Practice in writing Latin to the extent presented in Bennett's or Jones' Latin Composition or similar works.

VIII. German, Grammar, Joyne's Meissner, Whitney's or their equivalents. Ability to read easy prose fluently, and to translate at sight such a work as "Hauff's Maerchen" (Goold).

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

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

XI. 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.

XII. Physical Geography. One-half year, the equivalent of Tarr's Elementary Physical Geography.

XIII. Physiology. A half year. Martin's Human Body, Briefer Course, or its equivalent, with laboratory work representing a minimum of 75 hours of work.

XIV. Mechanical Drawing and Shop Work, one year.

REQUIRED FOR ADMISSION.

The subjects required for admission to the various courses are as follows:

Classical Course, I, II, III, IV, V, VI and VII.

Scientific Course, I, II, III, V or XI, two years of study in either ancient or modern languages, and two years of work selected from IV, X, XI, XII, XIII.

Letters Course, I, II, III, IV, V, VI, VII. For VII, wholly or in

part, the student may substitute two years of Modern Languages and one year of Science.

Mechanical Engineering Course. I, II, III, IV, V, VI, with any one of the following: VII which may be substituted by VIII or IX, wholly or in part, or by either X or XI with XII, XIII, XIV.

Graduation and Degrees.

In order to secure the recommendation of the Faculty for graduation from the University in any of the respective lines of work that have been outlined, it is necessary for the student to complete the equivalent of at least thirty-two full courses, as already defined in the section concerning collegiate courses, including an acceptable thesis. The thesis may represent a minimum of one course and a maximum of three courses, or such proportion thereof as in the judgment of the professor in charge it may merit.

That the needs and special inclinations of the different students may be consulted as far as possible, certain of these courses are required for each of the respective degrees and the rest are left for the student's selection.

The work required for the completion of the three courses in the College of Letters and Science shows at a glance the difference in the courses. Certain subjects are required of all students, others are required in special courses, others must be elected from definite lines of work, and still others are free electives. It is understood that the choice in free electives must in part be governed by the arrangement of subjects on the daily program, and that precedence will always be given to required work for the different degrees and the number of partial elective courses allowed.

GENERAL WORK REQUIRED FOR DEGREES, EXCEPTING B. S. IN MECHANICAL ENGINEERING.

Drawing, twice per week for one year, I, II	1 course
Rhetoric, I	1 "
Political Economy, I	1 "
Psychology and Ethics, I, II	1 "
Literature, I, II	2 courses
Biology, I, II	2 "
Chemistry, I, II	2 "
General required work	10 courses

WORK REQUIRED FOR DEGREE B. A.
(Classical Group).

General required work (given above)	10 courses
Special required work, Latin	5 "
Special required work, Greek Life	1 course
Special required work, Roman Life	1 "
Partial Electives, in Greek, Latin, Modern Languages	6 courses
Partial Electives, Trigonometry or Higher Algebra	1 course
Free Electives	8 courses
Total	32 courses

WORK REQUIRED FOR DEGREE B. S.

General required work (given above)	10 courses
Special required work, Trigonometry	1 course
Special required work, Higher Algebra	1 "
Special required work, Physics	2 courses
Partial Electives, Modern Languages	4 "
Partial Electives, Science and Mathematics	6 "
Free Electives	8 "
Total	32 courses

WORK REQUIRED FOR DEGREE B. A.
(Literary Group).

General required work (given above)	10 courses
Partial Electives, Ancient and Modern Languages	6 "
Partial Electives, History, Literature and Philosophy	8 "
Partial Electives, Trigonometry or Higher Algebra	1 course
Free Electives	7 courses
Total	32 courses

FOR THE DEGREE OF B. S. IN MECHANICAL ENGINEERING.

In Mathematics, I., II., III., IV., V.	5 courses
Model and Object Drawing, I., II.	1 course
Physics, I., II.	2 courses
Political Economy, I.	1 course
German, I., II.	2 courses
Chemistry, I., II., XII.	2¾ courses
Literature, II.	1 course

For the technical work required in the Mechanical Engineering course see tabular statement following.

BACCALAUREATE DEGREES.

The University grants the following baccalaureate degrees for undergraduate work:

I. The degree of Bachelor of Arts to those who complete either the Classical group or the Literary group in the College of Liberal Arts.

II. The degree of Bachelor of Science to those who complete the Scientific course.

III. The degree of Bachelor of Mechanical Engineering to those who complete the course in Mechanical Engineering.

ADVANCED DEGREES.

Master of Arts, Master of Science. The Degree of Master of Arts or Master of Science, will be conferred upon resident graduates on the following conditions:

I. The candidate must be a graduate of this University, or a University or College of good standing, as approved by the faculty.

II. He must have pursued, during one or more years, a course of graduate study at this University, the minimum requirement of work being represented by forty hours of credit.

III. The candidate may pursue one major study and two minors, one major and one minor, or may devote his entire time to the major, the division of time and arrangement of work to receive the recommendation of the department in which the major work is taken and the approval of the faculty. In any case one-half of the candidate's work must be on the major subject.

IV. The minor, or minors, must be closely allied to the major subject, provided, however, that any candidate, in residence for two or more years, may select any approved subject as a second minor for a degree.

V. All courses of study leading to advanced degrees are subject to approval first, by the head of the department of the University in which the major subject for each student belongs; second, by the faculty. The signatures of the heads of departments in which chosen minor subjects belong must also be obtained. The list of studies with the approval signatures must be deposited with the secretary of the faculty. No changes may subsequently be made except under the same line of approvals, but extension of time may be arranged with the professors concerned.

VI. He must submit a thesis of at least 5,000 words, showing

marked attainment in some branch of learning. The subject of the thesis must be announced to the Faculty for approval, not later than the second Friday in December, and the thesis itself must be presented to the examining committee at a date to be set by the professor in charge of the thesis work, not later, in any case, than May 20th of the year in which the degree is expected.

VII. He must, at the close of his course, pass a satisfactory examination, either oral or written, or both, conducted by a committee which shall consist of three professors, selected by the faculty for this purpose.

VIII. The degree of Master of Arts will be conferred only upon the completion of a course mainly literary in character and the degree of Master of Science upon one mainly scientific. The degree of Mechanical Engineer will be conferred on those holding the degree of B. M. E. on the same conditions as in the other courses.

IX. Graduate students pursuing courses for the Master's degree may by special permission of the Faculty, carry on a portion of the work in absentia.

Scheme of Courses Offered by the University.

*These courses are the general requirements for college courses.
†Technical courses in Mechanical Engineering.
Roman numerals indicate the number of the course; Arabic indicate the number of recitations per week.

MATHEMATICS.

First Semester.	*Second Semester.*
Trigonometry, I. 4.	Higher Algebra, II. 4.
Analytical Geometry, III. 4.	Calculus, IV. 4.
Calculus, V. 4.	Elective Geometry, VI. 1.
Elective Geometry, VI. 1.	Elective Geometry, VII. 1.
Elective Geometry, VII. 1.	Plane Surveying, VIII. 2.
†Descriptive Geometry.	Differential Equations, IX. 2.
	Advanced Analytical Geometry, X. 4.

PHYSICS.

Physics, I. 4.	Physics, II. 4.
Physics, III. Electrical Measurements, 3.	Advanced Lab. Physics, 2 or 4.

GEOLOGY AND MINERALOGY.

Mineralogy, I. 2 or 4.	Mineralogy, I. 2 or 4.
Geology, II. 4.	Geology, III. 4.
Lithology, IV. 2 or 4.	Economic Geol., V. 2.
Paleontology, VII. 2 or 4.	Blow Pipe Analysis, 2.

CHEMISTRY.

First Semester.	*Second Semester.*
*General Inorganic, I. 4.	*General Inorganic, II. 4.
Qualitative Analysis, III. 5.	Introductory Quantitative Analysis, IV. 4.
Introductory Quantitative Analysis, IV. 4.	Assaying, V. 3.
Mineral Analysis, VI. 4.	Mineral Analysis, VI. 4.
Organic Chemistry, VII. 2.	Organic Chemistry, VIII. 2.
Organic Preparations, IX. 2.	Organic Preparations, X. 2.
Physical Chemistry, XI. 3.	Industrial Chemistry, XIII. 3.
Metallurgy. XII. 3.	Research XIV.
Research, XIV.	

BIOLOGY.

General Biology, I. 4.	General Biology, II. 4.
Zoology, Invertebrates, III. 4.	Zoology, Vertebrates, IV. 4.
Botany, Histological, V. 4.	Botany, Systematic, VI. 4.
Microscopy, VII. 2 or 4.	Special Work, VIII. 4.
Special Work, IX. 4.	Photography, XI. 2.
Photography, X. 2.	Entomology, XII. 3.
Research, XIII.	Research, XIV.

GERMAN.

German, I. Joynes-Meissner—Grammar, 4.	German, II. Same. Joynes' Reader, 4.
German, III. Bernhardt—Composition, Conversation, 4.	German, IV. Peter Schlemihl, Wilhelm Tell. Composition and conversation. 4.
German, V. Schiller Wallenstein—Conversation and Composition, 4.	German, VI. Faust, 4. Deutsche Lit. Geschichte. Conversation and composition. Aus dem Reich Friedrichs des Grossen, 4.

FRENCH.

French, I. Chardenal's Complete Grammar, 4.	French, II. Chardenal's Complete Grammar. 3 Contes, Daudet, 4.
French, III. Napoleon. L'Abbe Constantin, 4.	French, IV. Colomba, 4. Racine { Esther. / Athalie.
French, V. Histoire de la Lit. Francaise. Composition and conversation, 4.	French, VI. Modern Writers and Classics. Composition and conversation, 4.

SPANISH.

First Semester.	*Second Semester.*
Spanish, I. Schilling's Spanish Grammar.	Spanish, II. Same.
Spanish, III. Same. La Vida es Sueno El si de las Ninas.	Spanish, IV. Modern Writers.
Spanish, V. Ruy Blas.	Spanish, VI. Cervantes.

ANCIENT LANGUAGE.

Latin, I. Virgil. 4.
Latin, III. Horace and Cicero's Essays. 4.
Latin, V. Comedy. 4.
Greek, I. Grammar and Lessons. 4.
Greek, III. Anabasis. 4.
Greek, V. Odyssey, Herodotus, Thucydides. 4.
Greek, VII. Dramatists. 4.
Private Life of the Greeks. IX. 4.

Latin, II. Virgil. 4.
Latin, IV. Livy and Tacitus. 4.
Roman Life. VI. 4.
Greek, II. Anabasis. 4.
Greek, IV. Iliad. 4.
Greek, VI. Plato, Demosthenes. 4.
Greek Archaeology, VIII. 3

HISTORY.

History, I. 4.
History, III. 4.
History, V. 4.

History, II. 4.
History, IV. 4.

POLITICAL ECONOMY.

Political Economy, II. 4.

*Elements of Political Economy, I. 4.

PHILOSOPHY AND EDUCATION.

Descriptive Psychology, I. 4.
History of Education, I. 4.
Ethics, I. 2.
Modern Philosophy, III. 4.

Experimental Psychology, II. 4.
Theory and Practice of Education, II. 4.
History of Philosophy, II. 4

RHETORIC AND LITERATURE.

First Semester.

*Rhetoric, I. 4.
*Literature, I. 4.
Literature, III. 4.
Literature, V. 4.
Literature, VII. 4.
Literature, IX.

Second Semester.

Rhetoric, II. 4.
*Literature, II. 4.
Literature, IV. 4.
Literature, VI. 4.
Literature, VIII. 4.
Literature, X.

DRAWING AND PAINTING.

Free-hand Drawing, I. 2.
Drawing and Painting, III. 2 or 4.
Drawing and Painting, V. 2 or 4.
History of Architecture and Sculpture, VII. 2.
Free-hand Drawing, II. 2.
Drawing and Painting, IV. 2 or 4.
Drawing and Painting, VI. 2 or 4.
History of Painting, VIII. 2.

WOOD AND IRON SHOP PRACTICE.

†Wood Shop.
†Iron and Steel Forging.
†Molding and Casting.
†Pattern Making.
†Machine Work.

Mechanical Engineering Course.

Roman numerals indicate courses; Arabic, hours credit.

FRESHMAN YEAR.

First Semester.

Trigonometry, I. 4.
German, I. 4.
Model and Object Drawing, I. 2.

TECHNICAL INSTRUCTION.

Wood Working Tools (14 Weeks), I. 1.
Lectures in Pattern Making and Foundry Practice (4 Weeks), I. 1.
Wood Shop Practice, (4 Weeks), I. 1.
Pattern Making (4 Weeks), I. 4.
Mechanical Drawing, I. 3.

Second Semester.

Higher Algebra, II. 4.
German, II. 4.
Model and Object Drawing, II. 2.

TECHNICAL INSTRUCTION.

Lectures in Pattern Making and Foundry Practice, II. 1.
Pattern Making and Molding and Casting, II 4.
Mechanical Drawing, II. 3.

SOPHOMORE YEAR.

Analytical Geometry, III. 4.
Descriptive Geometry, 4.
Chemistry, I. 4.

TECHNICAL INSTRUCTION.

Molding and Casting (6 Weeks), III. 4.
Forging (12 Weeks), III, 4.
Mechanical Drawing, III. 3.

Calculus, IV. 4.
Chemistry, II. 4.
Literature, II. IV.

TECHNICAL INSTRUCTION.

Lectures in Machine Shop Practice, III. 1.
Machine Shop Practice, IV. 4.
Mechanical Drawing, IV. 2.

JUNIOR YEAR.

Calculus, V. 4.
Kinematics, 3.
Physics, I. 4.
Metallurgy, 3.

TECHNICAL INSTRUCTION.

Machine Shop Practice, V. 2.
Machine Design, V. 3.

Analytical Mechanics, 3.
Theory of the Steam Engine and Steam Boiler, 4.
Physics, II. 4.

TECHNICAL INSTRUCTION.

Machine Shop Practice, VI, or Surveying, 2.
Machine Design, VI., 3.

SENIOR YEAR.

First Semester.

Strength of Materials, 4.
Thermodynamics of the Steam Engine, 3.
Graphical Statics, 2.
Electrical Measurements, 3.
Engineering Laboratory, 2.
Valve Gears, 1.
Steam Engine Design, 2.

Second Semester.

Political Economy, 4.
Electrical Engineering, 3.
Measurement and Transmission of Power, 2.
Hydraulics. 2.
Advanced Machine Design, 4.
Thesis, 4.

The Preparatory Department.

The Preparatory Course covers a period of three years, outlined in semesters, after the plan employed in the College Courses. It is expected students will take subjects in the order given.

Applicants for admission to the Preparatory Course should be at least fourteen years of age, and well grounded in the elements of an English education.

Admission may be made—

(a) By Certificate.

(1) Certificates or certified statements from superintendents, or from any graded school of good standing, showing completion of 8th grade work will be accepted in lieu of examination.

(2) Teachers' certificates given by County Superintendents will admit student to Preparatory Department without examination.

(3) Students are urged to bring when possible all record cards, certificates and diplomas, together with a written statement from superintendent, principal or teacher, on which the standing of the student is stated.

(b) By Examination.

Examinations in Arithmetic, Grammar, U. S. History, Reading, Spelling, and Geography will be given on days stated in the calendar of this catalogue.

Preparatory Departments of Instruction.

MATHEMATICS.

I. Elementary Algebra. First semester. 4. Unless admitted on certificate, applicants for admission to this course must pass a satisfactory examination in Arithmetic. This examination will consist of an oral and a written test. Subjects covered will be Factoring, Common and Decimal Fractions, Percentage (including simple applications), elements of Involution and Evolution, and the Metric System.

II. Algebra continued. Second semester. 4.

III. Algebra continued. First semester. 4. With the work of this semester a thorough review of Factoring, Fractions, and other important subjects will be given. In addition to the mastery of principles much drill work will be required, thus enabling the student to fix those principles and to gain that facility in Algebraic calculation that comes only by practice.

IV. Geometry, Plane. Second semester. 4.

V. Geometry, Plane. First semester. 4.

VI. Geometry, Solid. Second semester. 4.

Throughout the courses in Geometry much original work will be required. This original work will consist of demonstrations, constructions, and the solution of numerical problems involving the metric system and logarithms. In addition to the regular text, Estill's Numerical Problems in Plane Geometry, or its equivalent, will be used.

ENGLISH.

The aims of this work as pursued in the Preparatory Department are to enable the student to write good English with creditable facility, to develop a taste for the best literature, and to give the student a general knowledge of the history of the English language and the great periods in the development of English literature.

Composition and Rhetoric. The work as outlined will include drill in sentence building, a consideration of the principles of punctuation, paragraphing and outlining of Essays, a knowledge of the requisites of style and a familiarity with the figures of speech. The required written exercises will afford the means of applying the principles introduced, enlarging the vocabulary of the student, and enriching his forms of expression.

Literature. The student is directed in the careful study of form, structure and subject matter of the works included in list (a).

Written tests or papers will determine the value of the knowledge gained by the cursory reading of the works included in list (b).

Literary History will receive special attention. "Brooke's English Literature" will be used as an outline for this work.

(a) The following list of works has been selected for critical study:

Milton's Paradise Lost, Books I. and II. Burke's Speech on Conciliation with America, Shakespeare's Macbeth and Merchant of Venice, Carlyle's Essay on Burns, Macauley's Essay on Milton, and Macauley's Essay on Addison.

(b) List for reading: Tennyson's The Princess, DeQuincey's Flight of a Tartar Tribe, Addison's Sir Roger de Coverley Papers, Pope's Translation of the Iliad, Dryden's Palamon and Arcite, Lowell's Vision of Sir Launfal, Goldsmith's Vicar of Wakefield, Scott's Ivanhoe, and Cooper's Last of the Mohicans.

SCIENCE.

PHYSICS I and II. A year's work in Elementary Physics, required of all students. The text of Carhart and Chute will be used. Two recitations per week, five hours of laboratory work. Each student works individually the experiments, and records the results, with drawings, in a note book, which is submitted from time to time for examination. A good equipment of material is supplied, and every facility will be offered to produce the most successful work.

BIOLOGY I and II. Students preparing for Scientific Course must present a year of Biology, or in its stead a year of Chemistry. At present Biology alone is taught in the preparatory. This comes the first year, and consists of two recitations per week and two laboratory practices of two and one-half hours each. Special attention will be given to manipulation of material, to the formation of correct habits of work and study, and to the development of the powers of observation. The students receive instruction from the professor of Biology, and work under the same conditions and surroundings as the college students. For the year 1901-1902 Kingsley's Elementary Zoology will be used as a basis for work, and the dissections as therein indicated will be made. Much additional collateral reading will be given from time to time. Davenport's Zoology will be used the coming year in class recitations.

BIOLOGY, III. PHYSIOLOGY. The work will not be a mere digest of text books, but will be given for the purpose of broadening the view and enlarging the powers as well as gaining information. One-half of the time will be spent in the laboratory, where a series of valuable experiments and examinations will be made. Students will work in the biological laboratory, and will be given the same attention as college students.

LATIN.

The following general remarks are here made to avoid unnecessary repetitions under the courses outlined below.

1. The Roman pronunciation will be used. Pains will be taken to form habits of correct pronunciation. In this connection, the points to be especially emphasized are that long vowels shall be pronounced as long; also that every consonant shall be

distinctly enunciated. For preparatory work it is very desirable to use texts which have long vowels marked.

2. Bennett's grammar will be used and pupils are expected to master the elements of Latin grammar, at least as presented in the coarser print of this book.

3. In the preparation of pupils for the University courses, teachers throughout the state are earnestly requested to take pains to form habits of correct pronunciation; and to have almost daily some exercise in reading and translating at sight and in writing Latin. The importance of these points can scarcely be overestimated.

FIRST YEAR—

A First Year Latin Book Completed, comprising a complete presentation of forms, and the principal rules of syntax, with reading and composition for the application of these forms and rules.

SECOND YEAR—

Easy reading in Gradatim, followed by selections from Caesar. The equivalent of four books of Caesar will usually be read. Throughout the year lessons in Grammar and Composition will accompany the reading.

THIRD YEAR—

Cicero's Orations and Letters, composition exercises, and grammatical drill.

Five orations and some letters of Cicero will usually be read.

GERMAN.

Two years of German will be given in the Preparatory Classes.

First Year. Will be devoted to a thorough study of Grammar (Joyne's Meissner or Whitney's) with some easy prose reading, such as Hauff's Maerchen.

Second Year. Study of Syntax, dictation, and prose reading, such as Schiller's "Der Neffe als Onkel."

If students having finished this work wish to elect German in college they may begin with Course IV as shown on page——.

HISTORY.

First Year. The work will deal principally with Grecian and Roman History. The aim of the instruction will be not the memorizing of dates and facts, but the understanding of the relation of the events to each other. The Library of the University contains many

excellent reference books, and the work will be carried on by the library method rather than by the use of texts.

Second Year. The second year will be given to the study of Mediaeval and Modern History, with special reference to the development of France and England. Abstracts and theses on historical themes will continue to be a marked feature of the instruction.

MECHANICAL DRAWING AND SHOP WORK.

Second and third preparatory students intending to enter the Mechanical Engineering Course may take work in Mechanical Drawing and Shop Work, four hours per week, equally divided between drawing room and shop.

MECHANICAL DRAWING.—In the first year, instruction is given in the use and care of instruments, lettering, and drawing from copy.

During the second year, drawing from copy is continued, and drawings from sketches of simple machine parts, with sections and complete dimensions.

SHOP WORK.—During the first year, a course of exercises in carpentry and wood turning is pursued, for the purpose of teaching the use of ordinary wood working tools, and the simpler processes of construction.

In the second year, work in the wood shop is continued, the student adding to his experience by making book shelves, cupboards, and similar pieces of work. A portion of the time may be given to pattern making and foundry practice.

Course of Study.

FIRST YEAR.

First Semester.	*Second Semester.*
Algebra, 4.	Algebra, 4.
Composition and Literature, 4.	Composition and Literature, 4.
History, 4.	General History, 4.
*Latin, Biology, or Physical Geography, 4.	*Latin, Biology or Physiology, 4.

SECOND YEAR.

Algebra, 4.	Plane Geometry, 4.
Rhetoric and Literature, 4.	Rhetoric and Literature, 4.
General History, 4.	History, 4.
**Latin, German, Physical Geography, Biology, or Mechanical Drawing and Shop Work, 4.	**Latin, German, Physiology, Biology or Mechanical Drawing and Shop Work, 4.

THIRD YEAR.

Geometry, Plane, 4.	Geometry, Solid, 4.
Literature, 4.	Literature, 4.
Physics, 4.	Physics, 4.
***Latin, German or Mechanical Drawing and Shop Work, 4.	***Latin, German or Mechanical Drawing and Shop Work, 4.

* Latin for the Classical Course; Latin, Biology or Physical Geography and Physiology for other Courses.

** Latin for the Classical Course; Latin, German, Biology or Physical Geography and Physiology for the Philosophical and Scientific Courses; Latin, German, Biology, Physical Geography and Physiology or Mechanical Drawing and Shop Work for the Mechanical Engineering Course. Students in Scientific Course who do not elect Biology the first year must do so the second.

*** Latin for the Classical Course; Latin or German for the Philosophical and Scientific Courses; Latin, German or Mechanical Drawing and Shop Work for the Mechanical Engineering Course.

Accredited High Schools.

The State Board of Education in a meeting held June 1, 1896, took the following action:

"Candidates seeking admission to any of the regular courses in any State Educational Institutions must be at least sixteen years of age and must possess a good moral character and good bodily health.

. . . . . .

"Accredited Schools.—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 examinaion by a committee appointed by the State Board of Education. Application for such examination may be made by any school board to the Secretary of the State Board of Education, whereupon a committee appointed by the State Board of Education will examine the course of study and methods of instruction of the school, and on the committee's favorable recommendation, and the concurrence of the State Board of Education, it will be entered upon the accredited list of the State Educational Institution for which it applied. Any graduate of such an approved school will be received by the President of the State Educational Institution wherein said graduate is entitled to enter, on presentation of proper diploma and certificate from the Superintendent of said school, into any of the courses of said institution for which said graduate has been fitted.

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

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

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

This legislation is still in force.

At the December meeting of the Board it appointed a committee "to formulate a uniform plan for accredited high schools." The committee met in Helena December 28th, 1897, and formulated a plan, and a brief outline of work for accredited high schools which was adopted at the next meeting of the State Board of Education.

"This committee decided to recommend to the Board that the work of the eight grades, when arranged, shall be the standard for entrance to the high schools."

This recommendation, which was adopted by the Board, became of effect in 1899, when the State Common School Course of Study was published and placed in the hands of school boards, teachers, and superintendents, and it still remains in force.

In June, 1899 the State Board of Education instructed the Diploma Committee to revise the Course of Study for accredited high schools. At the December meeting the committee asked for further time, which was granted. At the regular meeting of the Board in June, 1900 the Diploma Committee reported this outline of work which was unanimously adopted.

Program of Studies.

FOR ACCREDITED SCHOOLS.

Classical Curriculum. Prepares for entrance to Classical Course, State University.	*Science Curriculum.* Prepares for all General Science Courses.	*English Curriculum.* Prepares for all Technical Courses and for the Normal School Professional Course.
FIRST YEAR.		
Latin English Algebra General History	English Algebra General History Physiology	English Algebra Physiology General History Word Analysis
Latin English Algebra General History	English Algebra Physical Geography General History	English Algebra Physical Geography General History Orthoepy and Phonics
SECOND YEAR.		
Latin English Algebra General History	German or Latin English Algebra Botany or Zoology	English Algebra Botany or Zoology General History
Latin English Plane Geometry General History	German or Latin English Plane Geometry Botany or Zoology	English Plane Geometry Botany or Zoology General History
THIRD YEAR.		
Latin English Plane Geometry Physics	German or Latin English Plane Geometry Physics	English Plane Geometry Physics U. S. History
Latin English Solid Geometry Physics	German or Latin English Solid Geometry Physics	English Solid Geometry Physics Arithmetic Civics

University of Montana Biological Station and Summer School of Science.

STATION STAFF.

OSCAR J. CRAIG, A. M., Ph. D.,
President.

MORTON J. ELROD, A. M.,
Director, General Zoology, Plankton Methods.

L. A. YOUTZ, A. M.,
Fellow, Columbia University.
Botany. (1901).

P. M. SILLOWAY,
Principal, Fergus Co. High School.
Ornithology. (1900 and 1901).

DANIEL T. McDOUGAL, Ph. D.,
Director of Laboratories, New York Botanical Garden,
Botany. (1900).

R. S. WILLIAMS,
New York Botanical Garden,
Ferns and Mosses. (1901).

MAURICE RICKER, M. S.
Principal, High School, Burlington, Ia.
Nature Study and Microscopical Technique. (1901).

The Summer School of Science and Biological Station has been opened for the purpose of extending some of the privileges of the University to the public school teachers of the state and to such others as choose to do some work in biological lines, and to make a beginning of the study of the life of the state. The state is rich in resources that are practically untouched. There are many who desire such an opportunity as the summer school and station will offer, and who cannot afford a trip to eastern summer schools of science.

The site chosen for the station is on the bank of Swan or Big Fork River, near the outlet, on land adjoining the Flathead Club grounds, at the northern end of Flathead Lake. A piece of ground of some five acres has been leased for a number of years, and a small laboratory, 18x24, containing a small store room, a dark room, and tables for twelve students, was built on the bank of the river and close to a large spring of pure water. The ground is well adapted for camping, and board of excellent quality may be had at private families if desired. As the work progressed the wisdom of the choice of location became apparent. At this point the river offers a perfect harbor for boats. Fishing is excellent. Birds are exceedingly abundant. A few hours walk and one can reach Swan Lake, Echo Lake, Mud Lake, and in the region of Kalispell many other lakes are to be found. The Lewis and Clarke Forest Reserve extends almost to the Station, offering special inducements in some lines of work. It is but two miles to Flathead River, and the region north of the Station is a rich agricultural and fruit country, whose merits are very imperfectly known. The river immediately above the Station is a series of cataracts for a distance of two miles, the water a sheet of foam coming down with a roar heard day and night for miles.

The location of the Station at Flathead Lake is ideal. The lake is thirty-two miles long, and at its widest part fifteen miles wide. A steamer runs from Demersville on the north to the foot of the lake on the south three times a week. The altitude is about 2,500 feet. Flathead and Swan rivers flow into the lake from the north, the Pend O'Reille flows out of the southern arm. Numerous creeks, arms of the lake, swamps, forests and valleys are close to the Station, which is on the northern shore, offering abundant opportunity for littoral, land, and aerial faunas. Flanking it all the Mission mountains, with snow clad summits and living glaciers, the home of the goat and the sheep, extend the entire length of the lake and valley. The Mission mountains have become famous for their beautiful scenery, charming Alpine lakes, rugged and jagged peaks and beautiful falls.

The work of the station and summer school of science is part of the University work, the station being considered as a department. Those in attendance may, if they desire, have credit on the University record for such an amount of work as may be done at the station.

How to Reach the Station.—Those on the line of the Great Northern should get off at Kalispell. Demersville is four miles from Kalispell. Take the steamer at Demersville for the sta-

tion. On the Northern Pacific stop at (Ravalli) Selish, stage to Polson at the foot of the lake, steamer across the lake to the station. Those contemplating attendance should write the director early and make arrangements. The facilities of the station are limited, and those first applying will be first accommodated.

Courses. The work offered in 1901 will be as follows:

ZOOLOGY.

(a) Laboratory and field work, including dissection or microscopic study of type forms, with field work and instruction in collecting and preserving material for laboratory use and permanent collections.

(b) Field and laboratory course in entomology. Instruction in collecting, preserving and labelling insects. Dissection and study of type specimens.

(c) Course in Ichthyology, devoted particularly to lake fishes, their habits and food.

(d) A course in plankton methods. Collecting of microscopic organisms, determination of quantity, examination of material.

(e) Ornithology. A study of birds, with methods of collecting, making and preserving skins; habits and lives of birds of the rich avian region adjacent.

BOTANY.

(a) Laboratory and field course; study of type forms. The course will consist of collecting trips in the field where common species of the different orders are found, classification of the more common species, study of structure, with methods of preservation, both dry and in liquid, for immediate and permanent use.

(b) A study of plant relations to environment, as illustrated by the varied conditions of the region; relations of climate and vegetation.

(c) Laboratory course, work to be arranged.

Photography. Instruction will be given to all those desiring it. Students in photography will furnish their own cameras and plates or films.

A few tables will be set apart for investigators, supplied with microscopes and the usual stains and reagents. A number of microscopes will be supplied for use in the general work. Every opportunity and facility will be given students attending to make and prepare collections of specimens in any quantity, either for their own use or, if teachers, for the use of their classes.

Material for actual use will be provided free of charge. Attending students will be charged for material consumed, for breakage, and for the necessary expenses, such as hired help, gasoline, etc. Students may adopt one of three plans. They may take tents and do their own cooking, in regular camp style; or they may tent and take meals; or they may secure meals and lodging. Meals may be had at $5.00 per week. Camping at this season will be a delight. The nights are cool and pleasant, the days warm. Rains seldom occur. Those not wishing to attend the entire time should state when and how long they may wish to attend.

RECREATION.

Many will wish to combine an outing with study. Fishing near the laboratory is excellent. There are many boats besides those of the Station, and rowing may be indulged in. The field is excellent for photography. Bathing in the lake is always a treat and the beach is fine. The region has an abundance of fruit of all kinds. The hills and forests afford quiet retreats for study or for strolls. Few places have more natural attractions. At the proper season hunting is good. Deer have been seen a few rods from the laboratory. Grouse and pheasants abound in the hills. In season duck shooting is fine. Most of the country affords good wheeling for bicycles.

FEES AND EXPENSES.

There are no tuition fees. Students attending will be charged for material consumed, for breakage, for a share of the expense for excursions, and like necessary expense. Necessary books, chemicals, microscopes, and glassware will be supplied free. The intention is to give the best facilities possible, so as to make it worth while for students to attend.

DATE OF OPENING.

The course of instruction will be open Monday, July 22, and continue four weeks. It will be most satisfactory to enter at the beginning, but from the nature of the work students may enter at any time.

Applications should be made as early as possible, as the accommodations are limited, and the material taken from the University will of necessity be only enough to supply those in attendance.

A collecting trip of four or five weeks will be taken prior to the opening of the Station. It will be possible for a very small number to accompany this expedition on payment of a share of the expense.

Those wishing to attend at the station and who desire further information should address the director, Morton J. Elrod.

Degrees Conferred.

COMMENCEMENT, 1901.

ACADEMIC DEGREES.

The degree of Bachelor of Arts, upon—

Sue Lewis ..... Missoula
Mary Lewis ..... Missoula

The degree of Bachelor of Philosophy, upon—

Estella Bovee ..... Glendive
Bertha Simpson ..... Stevensville
Sidney Mire Ward ..... Hamilton
Kathryne Wilson ..... Helena

The degree of Bachelor of Science, upon—

Hugh Graham ..... Missoula
Lydia Jimmie Mills ..... Lo Lo

The degree of Bachelor of Mechanical Engineering, upon—

George Cutler Westby. ..... Missoula

HONORARY DEGREES.

The degree of Doctor of Laws (L. L. D.) upon—

Hon. Thomas H. Carter ..... Helena

COLLEGIATE STUDENTS.

Name	Course.	Credit.	Residence
John Frederick Anderson	B. M. E.	Junior	Missoula
Harold Niles Blake	B. M. E.	Junior	Ft. Missoula
Charles Bean	B. S.		Bonner
Oral J. Berry	B. S.	48	Drummond
Estella Bovee	B. Ph.	132	Glendive
William Cochrane	B. Ph.	18	Red Lodge
Edwin Reed Corbin	B. S.	8	Butte
Grace Alma Conklin	B. A.	35	Sheldon
William Oscar Craig	B. S.	91	Missoula
William Oren Dickinson	B. S.	34	Missoula
Hugh Alexander Graham	B. S.	131	Missoula
Nina Jean Graham	B. Ph.	60	Missoula

Name	Course	Credit	Residence
George Herbert Greenwood	B. A.	32	Anaconda
Mabel Emily Jones	B. Ph.	65	Missoula
Florence Johnson	B. A.	12	Philipsburg
Lillian Frederick Jordan	B. Ph.	42	Glendive
Martin Jones	B. S.	73	Galloway, Mo
Helene Kennet	B. Ph.	47	Missoula
Helen Marie La Caff	B. Ph.	96	Carlton
Mary Lewis	B. A.	128	Missoula
Sue Lewis	B. A.	131	Missoula
Lucy Likes	B. Ph.	68	Missoula
Rella Likes	B. Ph.	62	Missoula
Vincent Joseph McGrath	B. M. E.	Freshman	Garrison
Agnes McDonald	B. A.	92	Anaconda
Albert Homer McDonald	B. S.	97	Missoula
Frances Inez Maley	B. Ph.	122	Missoula
Claude Otto Marcyes	B. S.	45	Forsythe
Alexander Grant McGregor	B. M. E.	Junior	Stevensville
Helen Jeanette McPhail	B. A.	96	New Chicago
Lydia Jimmie Mills	B. S.	136	Lo Lo
Jeannette Pickering Rankin	B. S.	107	Missoula
Harriet Laura Rankin	B. S.	69	Missoula
Wellington Duncan Rankin	B. S.	53	Missoula
Paul Miller Reinhard	B. M. E.	Sophomore	Missoula
Ida Groves Rigby	B. Ph.	71	Carlton
Eloise Rigby	B. S.	74	Carlton
Madge Robb	B. A.	32	Albia, Ia
Margaret Teresa Ronan	B. A.	105	Missoula
Katherine Josephine Ronan	B. A.	108	Missoula
Charles Oscar Savage	B. M. E.	Sophomore	Red Lodge
Pearl Scott	B. A.	104	Philipsburg
Leslie Mitchell Sheridan	B. M. E.	Sophomore	Missoula
Benjamin Stewart	B. S.	97	Missoula
Hugh Sloane	B. M. E.	Freshman	Missoula
Guy Emerson Sheridan	B. S.	113	Missoula
Bertha Adams Simpson	B. Ph.	128	Stevensville
Bessie Anna Totman	B. A.	56	Missoula
Fred. Erwin Wagstaff	B. A.	40	Missoula
Josephine Wagstaff	B. A.	61	Missoula
Sidney Mire Ward	B. Ph.	128	Hamilton
Edith Watson	B. A.	90	Red Lodge
Myrtle Weber	B. A.	40	Hamilton
George Cutler Westby	B. M. E.	Senior	Missoula
Kathryne Clara Wilson	B. Ph.	148	Helena

THIRD PREPARATORY.

Sarah Amelia Beckwith ..... Missoula
Joseph Buckhouse ..... Ft. Missoula
Grace Buker ..... Missoula
Hugh Duncan Galusha ..... Sheridan
Walter Hay ..... Missoula
Gilbert Heyfron ..... Missoula
Roxy Howell ..... Butte
Herbert Henry Hughes ..... Missoula
Sarah Clarinda Jones. ..... Corvallis
May Pearl Logan ..... Stevensville
George Durby Lyon ..... Drummond
Avery Falkner May ..... Missoula
Beulah Madge Morgan ..... Missoula
Georgia Evelyn Polleys ..... La Crosse, Wis.
Ward Rathbun ..... Missoula
Clarence Herbert Raymond ..... Missoula
Sadie Schmalhausen ..... Missoula
Charles Edmund Simons ..... Missoula
Blanche Mae Simpson ..... Stevensville
Ona Mansfield Sloane ..... Missoula
Ray Epperson Walters ..... Missoula
Ruth Ward ..... Hamilton
Edward Williams ..... Missoula
Elmer Franklin Woodman ..... Butte
Della Taylor Wright ..... Missoula

SECOND PREPARATORY.

William David Beck ..... Missoula
James Bonner ..... Missoula
Ivy May Boss ..... Missoula
Fred Elliott Buck ..... Stevensville
Maud Burns ..... Twin Bridges
Media Butler ..... Hamilton
Mildred Emma Corbin ..... Butte
Wilbur Sanders Day ..... Missoula
Jane Darbee ..... Missoula
George Thomas Farrell ..... Virginia City
Grace Serena Flynn ..... Missoula
Leif Thor Fredericks ..... Missoula
Edwin Frank Graver ..... Missoula
Leo Greenough ..... Missoula
Isabel Hamilton ..... Missoula
Floyd James Hardenburgh ..... Missoula

Sadie Gertrude Harris ..... Martina
Laurens Lind Hechler ..... Hamilton
Alice Herr ..... Bannack
Lulu Mary Hoepfner ..... Helmville
Nora Loretta Hogan ..... Red Lodge
Florence Matilda Johnson ..... Virginia City
Maud Esther Johnson ..... Virginia City
Russell Barclay Jones ..... Missoula
John Reuben Latimer ..... Missoula
Nellie Nanna Ray Lewis ..... Missoula
William Archibald Manson ..... Missoula
Ada May Matthus ..... Missoula
Roy Daniel McPhail ..... New Chicago
William Gilbert Mills ..... Missoula
William Hovey Polleys ..... La Crosse, Wis.
Edith Pulliam ..... Missoula
Ivy Ranche ..... Missoula
Fred Rigby ..... Carlton
Viola Anabel Ross ..... Missoula
Mary Alice Slaughter ..... Missoula
Jessie Slaughter ..... Missoula
Earl Spencer Smith ..... Missoula
Thomas Claude Spaulding ..... Missoula
Marguerite Olive Stevens ..... Missoula
Fred Joseph Tietjen ..... Missoula
Edward Martin Tucker ..... Victor
Caroline Mary Wells ..... Missoula
Florence Arloine Wood ..... Missoula
Flora Winzetta Yerrick ..... Missoula

FIRST PREPARATORY.

Ethel Olive Ambrose ..... Missoula
Flora Belle Anderson ..... Plains
Warren Horace Berry ..... Drummond
Effie Buker ..... Stevensville
Grace May Burrill ..... Clare, Mich.
Harry Cahill ..... La Junta, Colo
Pearl Melinda Card ..... Florence
Bessie Lee Clynick ..... Bonner
Edith Ellen Coughenour ..... Corvallis
Charles Schoval Dimmick ..... Missoula
Myrtle Dobbins ..... Stevensville
William Frederick Dodge ..... Ft. Missoula
Ethel May Douglas ..... Clark, S. Dakota

Aggie Phyllis Egan ..... Hamtown, New Brunswick
Ethel Sara Eisenberg ..... Butte
Thomas Joseph Farrell ..... Virginia City
Linda Ellen Featherman ..... Drummond
Frederick Frazer ..... Florence
Susie Garlington ..... Hillsboro, Oregon
Rufus King Garlington ..... Hillsboro, Oregon
Helen Flora Graham ..... Missoula
Laura May Hamilton ..... Missoula
Hattie May Hammond ..... Ovando
Agnes Hughes ..... Missoula
Anna Josephine Hutter ..... Missoula
Maude Jameison ..... Florence
Elmer Reed Johnson ..... Virginia City
William Warnford Keith ..... Missoula
Ralph Emerson Logan ..... Stevensville
Simon Ray Logan ..... Stevensville
Anna Ethel Manheim ..... Missoula
Jennie May Manson ..... Missoula
Charles Sims Marshall ..... Missoula
Maud Madge Mason ..... Missoula
Charles Michael McCauley ..... Missoula
Lee Chaffee McElwain ..... Helmville
Jennie Andrus McGregor ..... Missoula
Herman Cole McGregor ..... Stevensville
Herbert Alton Metcalf ..... Stevensville
Lucia Bush Merrielees ..... Big Timber
Harry Clay Mitchell ..... Corvallis
John William O'Hare ..... Florence
Ethel Virginia Perro ..... Drummond
Maude Adeline Pieon ..... Lakota, N. Dakota
Chester Joseph Richlie ..... Missoula
Lawrence Lee Simpson ..... Stevensville
Joseph William Streit ..... Highwood
Alice Stuart ..... Stevensville
John Edgar Swenson ..... Missoula
Daisy Fanny Toombes ..... Grand Rapids, Minn.
Mary Harriet Towne ..... Billings
Lola Lovisa Ulm ..... Toston
Joseph Waigel ..... Kalispell
Amanda Waldbillig ..... Drummond
Dale Ward ..... Hamilton
Lillian Warren ..... Carrollton, Ill.
Arthur Newton Westby ..... Missoula
Herbert Bromley Williams ..... Missoula

Franklin Joseph Wilson ..... Deer Lodge
Joseph Warren Woodruff ..... Stevensville
Ida Belle Wright ..... Stevensville
Carrie Lucile Young ..... Ovando
Bessie May Young ..... Ovando

SPECIAL STUDENTS.

Charles Allard ..... Chemistry ..... Ravalli
Alice Bardwell ..... Drawing ..... Missoula
Mrs. Burns ..... Drawing ..... Twin Bridges
Olyf Bye ..... Assaying ..... Missoula
Mrs. Corbin ..... Library Economy ..... Butte
Mrs. Durfee ..... Photography ..... Missoula
Grace Lambert ..... Drawing ..... Missoula
Oscar Sedman ..... Mineralogy ..... Virginia City

SCHOOL OF MUSIC.

Birdie Abbot ..... Missoula
Lucy Arnett ..... Missoula
William Beck ..... Missoula
Saidie Beckwith ..... Missoula
Ivy Boss ..... Missoula
Lulu Boss ..... Missoula
Grace Burrill ..... Clare, Mich.
Elmer Carter ..... Missoula
Bessie Clynick ..... Bonner
Bertha Cushing ..... Missoula
Mary Elrod ..... Missoula
George Greenwood ..... Anaconda
Alice Hatheway ..... Missoula
Bertha Hammond ..... Missoula
Frances Hatheway ..... Missoula
Roxy Howell ..... Butte
Norah Hogan ..... Red Lodge
Agnes Hughes ..... Missoula
Lillian Jordan ..... Glendive
Gertrude Kohn ..... Missoula
Larina Latimer ..... Missoula
Maime Latimer ..... Missoula
Helen La Caff ..... Carlton
Nettie Mc Phail ..... New Chicago
Roy Mc Phail ..... New Chicago
Dorothy Polleys ..... Missoula
Victoria Menard ..... Missoula

Edna Mentrum	Missoula
Hattie Rankin	Missoula
Mary Rankin	Missoula
Katherine Ronan	Missoula
Marjory Ross	Missoula
Jeannette Ross	Missoula
Lucile Stephens	Missoula
Sadie Schmallhausen	Missoula
Margaret Stevens	Missoula
Florence Sweetman	Missoula
Mary Harriet Towne	Billings
Edith Watson	Red Lodge
Sidney Williams	Missoula
Florence Wood	Missoula

SUMMARY.

Collegiate Students	55
Third Preparatory	25
Second Preparatory	45
First Preparatory	63
Specials	8
Music	41
Summer School of Science	17
	254
Counted twice	19
Net Total	235

Miscellaneous.

CONVOCATIONS.

All students are required to attend the regular weekly convocations which are held on Wednesday at 10:30 A. M. Special convocations may be held from time to time as the interests of the University demand.

SOCIETIES.

Two literary societies, the Hawthorne and Clarkia, are open to students. The first-named Society is composed of young men and the second young women. Both societies are alive and a credit to the University. Students attending the University will find membership in either of these societies most helpful and pleasant. The Athletic Association is well organized and has a large membership of both young men and women.

PRIZES.

THE H. N. BUCKLEY ORATORICAL PRIZE.

Through the generosity of Dr. J. J. Buckley, of Missoula, this prize has been founded in memory of his father, H. N. Buckley.

The amount of the prize is twenty dollars and this amount is derived from a permanent investment made to secure its endowment. The conditions of the oratorical contest at which the prize is bestowed are subject to the control of the Faculty.

This prize was awarded in 1896 to Miss Anna Gray; in 1897 to Charles Pixley; in 1898 to Louise Hatheway; in 1899 to Guy H. Sheridan; in 1900 to Eben Hugh Murray, and in 1901 to Kathryne Wilson.

PRIZE CONTEST IN DECLAMATION.

This is open only to preparatory students. The first prize is twenty dollars and the second ten dollars. The winner of the first prize in 1898 was Miss Nina Tibault. In 1899 the first prize was won by Gilbert Heyfron, and the second by William Dickinson. In 1900 the first prize was won by Lawrence Heck-

ler, and the second by Washington J. McCormick. In 1901 the first prize was won by Elmer Woodman and the second by Mildred Corbin.

The friend of the University who so liberally donates this prize desires his name to be withheld.

THE COBBAN PRIZES.

Mr. R. M. Cobban, of Missoula, has offered prizes for scientific research in Geology and Physical Geography. In each case the first prize is fifteen dollars and the second five. Papers are to be prepared on assigned subjects. These papers are submitted to a committee consisting of the donor and two members of the Faculty.

THE STATE ORATORICAL ASSOCIATION.

This association was organized last year. The institutions represented are the Montana Wesleyan University, the Montana College of Agriculture and the Mechanic Arts and the University of Montana. The purpose of the association is to promote the interest of work along oratorical lines.

The contest in 1900 gave first place to the representative from the University, and that of 1901 gave first place to the representative from the College of Agriculture and Mechanic Arts.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

This organization is in a flourishing condition with a large and increasing membership. Regular meetings for Bible study have been held throughout the year. These have been well attended and much interest in the work has been manifested.

THE JOHN M. EVANS HALL.

Through the liberality of Hon. J. M. Evans and other citizens of Missoula, the Literary Society Hall has been elegantly furnished. The dedication was held March 18, 1900, and was attended by a large number of students and citizens.

Mr. Evans having taken the initiative in the effort to furnish the room it was considered proper to name the hall after the principal donor and so it was christened the John M. Evans Hall.

THE UNIVERSITY SILVER CORNET AND ORCHESTRAL BAND.

The University is in possession of a full set of musical instruments which were donated by the Garden City Cornet Band.

A permanent organization has been effected and the band is doing some excellent work. The instruments are used on the same basis as other University material and are thus accessible to any who desire to take up this kind of work.

THE UNIVERSITY PAPER.

The Kaimin, through the effective efforts of its corps of editors, has become a permanent factor in the University life. The various difficulties, incident to the launching of a new enterprise, have been met, and the success of the University paper is assured.

The Board of Editors elected the past year was as follows:

Editor in Chief ..... Kathryne Wilson
Literary Editor ..... Estella Bovee
" ..... George Westby
Local Editor ..... Katherine Ronan
Exchange Editor ..... Benjamin Stewart
Business Manager ..... Sidney Ward

THE WEATHER SERVICE.

On the departure of the 25th U. S. Infantry from Fort Missoula, the instruments belonging to the Weather Bureau were placed in the keeping of the University. The instruments consist of a set of maximum and minimum thermometers, a standard thermometer, instrument shelter and rain gauge. A pair of wet and dry bulb thermometers for determining the dew point has been added, and also a standard barometer of the Fortin pattern.

The records at Fort Missoula had been taken continuously for nineteen years. As the University is but four miles from the Fort in practically the same climatic conditions, the continuation of the observations is very desirable.

The work has been placed in charge of Prof. M. J. Elrod of the Department of Biology.

THE UNITED STATES GEOLOGICAL SURVEY.

A topographical map of a portion of the state having Missoula as the center is being prepared by the government. This

region is later to be worked up geologically, and will be given in the series of geological maps now being issued by the U. S. Geological Survey. The University is aiding in this work in every way possible, and will be very much benefited by the results reached by the survey. At the present writing a bench mark for altitude has been placed in the stone at the left entrance to the main building, the altitude being 3,212 feet above sea level. This has now been corrected by the survey brought in from the Pacific Ocean whereby the corrected height of 3,223 feet is established. The triangulation party has established a bench mark on the campus, with stone piers marking the meridian line, giving the latitude and longitude. The University therefore has altitude, latitude and longitude accurately determined, and these marks will no doubt be starting points for future work.

ATHLETICS AND GYMNASIUM WORK.

A committee from the Faculty, entitled The Committee on Athletics and Gymnasium Work, has general oversight of the athletic sports and gymnasium. The details of the management are in the hands of the Board of Directors of the Athletic Association. Regular gymnasium classes have been organized during the past year. One of young men and one of young ladies. The class of young men have exercises with the dumb bells, Indian clubs, punching bag, etc., together with seventeen "setting up" exercises and military drill. The class of young ladies are drilled with the dumb bells, Indian clubs, free arm exercises, wands and general calisthenics. This has been made possible by one of Missoula's foremost citizens, Mr. C. H. McLeod, who has very kindly equipped the gymnasium with parallel and horizontal bars, trapeze and swinging rings, chest weight machines, and Whitely exerciser, vaulting horse, punching bag, boxing gloves, fencing foils, Indian clubs, dumb bells, wrist and finger machines, and a rowing machine. Besides these there are two small mats for the bars, and a large gymnasium rug, sixteen feet square, for wrestling and boxing.

The athletic field, located in the northwest corner of the Campus is now in excellent condition. A quarter of a mile running track is nicely finished, and the entire field has been well scraped and leveled. Within this track there is located the base ball diamond, the foot ball field and the tennis courts and croquet grounds.

The general sports indulged in are foot ball, basket ball and base ball, together with the indoors and out doors field sports.

The Faculty have established the following important regulations:

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

Second. Only bona fide students in the University, taking at least eight hours per week of recitations or lectures, can represent the University in any of its games with other college teams. Teams representing the University will not be permitted to play teams representing other schools or colleges unless the latter conform to the same requirement for study.

FEES AND DEPOSITS.

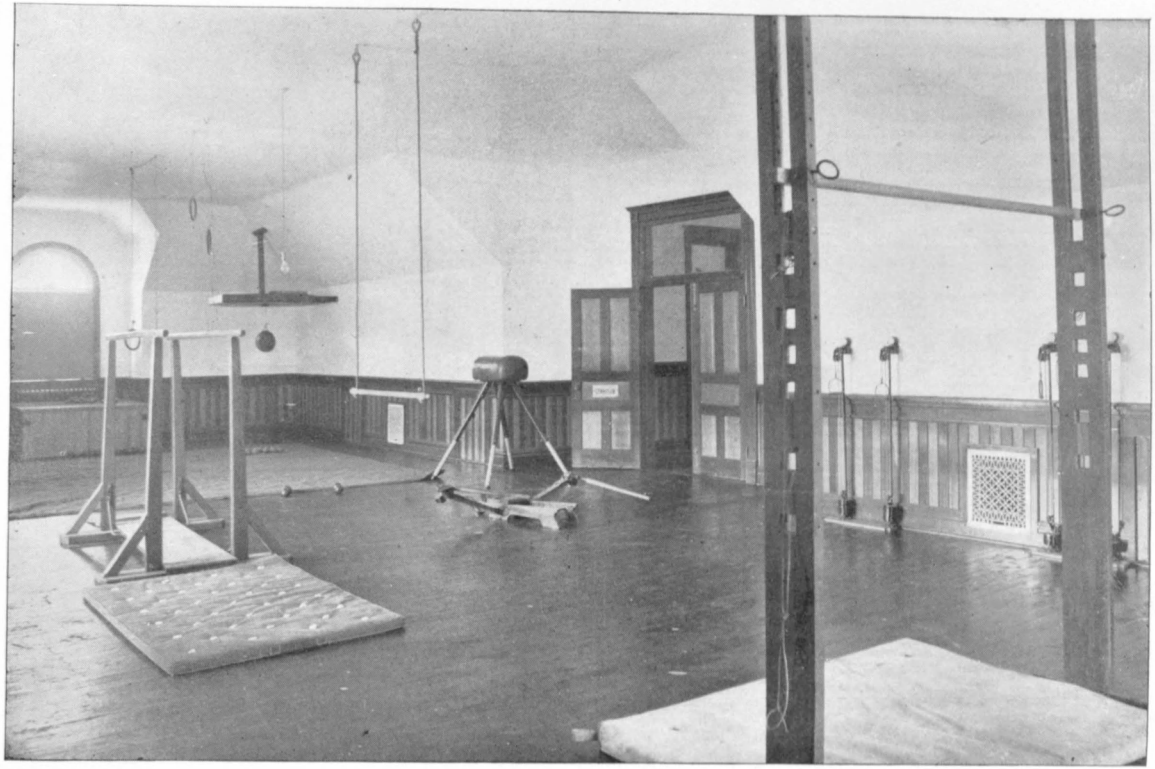
Preparatory, or any College Course, per year (Matriculation fee), payable at entrance	$10.00
Athletic fee, per semester	1.00
Physical apparatus (deposit) per semester	3.00
Chemistry I and II—Chemical apparatus (deposit) per semester	7.50
Chemistry III—Qualitative apparatus (deposit) per semester	6.00
Chemistry IV—Quantitative apparatus (deposit) per semester	6.00
Chemistry V and VI—$10.00; each additional hour	2.00
Chemistry IX and X—Organic Chemistry (deposit) per semester	10.00
Assaying apparatus (deposit) per semester	10.00
Deposit, Biological Laboratory, per semester	3.00
Deposit, Mechanical Engineering Laboratory, per semester	5.00
Photography	5.00

EXPENSES.

There are no dormitories connected with the University, and students are expected to find rooms and board in private families. Good homes can thus be provided for all and at very reasonable rates. Expenses may be very materially lessened by the formation of boarding clubs. Students will not be allowed to board at places not approved by the Faculty.

UNIVERSITY SURROUNDINGS.

Missoula is located in Western Montana, on the main line of the Northern Pacific Railroad, and at its junction with the Bit-



GYMNASIUM

ter Root Valley and Coeur d'Alene branches, thus affording easy railroad connections with all parts of the State and the Northwest.

The City of Missoula is noted as being one of the most beautiful in the west; and is unexcelled as regards pure water, healthful surroundings, beautiful scenery, and all of those things that contribute to make student life pleasant and agreeable.

Situated at the head of the Missoula valley and near the outlet of the Bitter Root valley, it is within the limits of the great agricultural and fruit growing regions of the state.

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