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CATALOGUE

OF THE

UNIVERSITY OF WISCONSIN

FOR

1893-94

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UNIVERSITY OF WISCONSIN

FOR

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MADISON, WIS.
PUBLISHED BY THE UNIVERSITY
1894

DEMOCRAT PRINTING CO., . . .
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CALENDAR.

ACADEMIC YEAR, 1893-4.

FALL TERM, September 13 — December 22, 14½ weeks.

WINTER TERM, January 8 — March 30, 12 weeks.

SPRING TERM opens April 9, closes June 20, 10½ weeks.
Legal Holiday, Wednesday, May 30.
Examination of Candidates for Admission, Thursday and Friday, June 14, 15.
Baccalaureate Address, Sunday, June 17.
Class Day and Address to Law Class, Monday, June 18.
Alumni Day, Tuesday, June 19.

COMMENCEMENT, Wednesday, June 20, 9 A. M.

SUMMER VACATION, June 20 — September 12.

SUMMER SCHOOL opens July 9, closes August 3.

ACADEMIC YEAR, 1894-5.

EXAMINATION of Candidates for Admission, September 11, 12.

FALL TERM opens Wednesday, September 12.
First Recitations, Thursday morning, September 13.
Thanksgiving Recess, November 29, December 1.
Fall term closes Friday, December 21.
Christmas Vacation, December 22 — January 7.

WINTER TERM opens Monday, January 7, 1895.
First Recitations, Tuesday morning, January 8.
Legal Holiday, Friday, February 22.
Winter Term closes Friday, March 29.
Spring Vacation, March 30 — April 8.

SPRING TERM opens Monday, April 8.
First Recitations, Tuesday, April 9.
Spring Term closes Wednesday, June 19.
Summer Vacation, June 19 — September 11.

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II. Graduate Courses, leading to higher degrees.

HISTORY AND LOCATION.

In 1838 an act was passed by the territorial legislature establishing the University of the Territory of Wisconsin, and appointing a Board of Visitors for its government. No action toward establishing the University was taken under this law except the selection of two townships of land appropriated by Congress. In 1848 the constitution of the State of Wisconsin made provision for the establishment of a State University.

In 1849 the Board of Regents held its first meeting and began the work of organizing the University. The first building (now North Hall) was constructed in 1851. Four years from that time Agricultural Hall was completed, and in 1861 University Hall was finished. In 1866 the University was reorganized by act of the legislature, which also provided for uniting with the University the College of Agriculture, endowed with the proceeds of the Agricultural College grant given by the United States in 1862. In 1867 the first appropriation, of about $7,000 a year, was made by the State. Since that date the State has made repeated and large appropriations of money for the construction of buildings and for providing apparatus, and also for meeting the ordinary expenses of the institution. The College of Law was established in 1868; the College of Engineering began its work in 1870; the School of Pharmacy in 1883, and the School of Economics, Political Science, and History in 1892.

The University of Wisconsin is picturesquely situated at Madison, the capital of the State of Wisconsin. The University grounds comprise 240 acres, and extend for more than a mile along the south shore of Lake Mendota, a sheet of water about

four miles in width and six miles in length. University hill occupies the eastern part of the grounds. It rises abruptly from the lake and has two summits, of which the eastern and higher reaches a height of about one hundred feet above the lake. Most of the college buildings are placed on the summit and eastern slope of this hill. The western part of the grounds is lower and more nearly level and is occupied by the Experimental Farm, belonging to the College of Agriculture. East of the University hill lies a small tract known as the Lower Campus, used for athletic sports and as the drill ground. At the session of 1893 the legislature provided for the purchase of Camp Randall, a tract of ground including 42 acres, and joining the University grounds to the southwest.

The buildings of the University which are used for instructional purposes are thirteen in number. The three oldest, University Hall, North Hall, and Agricultural Hall, stand on or near the eastern summit of University hill. Agricultural Hall is occupied by the offices, lecture rooms, and laboratories of the College of Agriculture; North Hall is used by the departments of German and Scandinavian languages, and the School of Pharmacy; while University Hall contains the lecture rooms for most of the remaining departments of language and literature. These buildings were erected out of the money derived from sales of land granted by the national government. Across the east front of the campus, at the foot of University hill, is a row of more recent buildings, all of them erected at the expense of the State of Wisconsin. At the south is Ladies' Hall, built in 1870, and used as a dormitory for young women; next stands the Library and Library Hall, completed in 1879. Still further north is Science Hall, the largest and most costly of the University buildings, completed in 1887, containing the lecture rooms, laboratories and museums of most of the scientific departments of the University, and of those of the College of Engineering. Next to Lake Mendota is the Chemical Laboratory, built in 1885, and behind this is the Machine Shop, erected in the same year. Half-way up the slope of University hill, on the south side, is the new building for the Law School, which in addition to the library and lecture rooms of the College of Law, contains the offices of the Board of Regents and the President of the University, and the rooms of the School of Economics, Political Science, and History. On the western summit of University hill is the Washburn Observatory, built in 1878 by the late Hon. C. C. Washburn, and presented to the University. Near it are the Students' Observatory and the astronomer's house. On

the western slope of the hill is the building for the Dairy School, constructed in 1891, and near it is placed the new Horticultural Building, whose erection was authorized by the legislature of 1893; while further west lie the numerous buildings of the Experimental Farm. Between the lower campus and the lake is placed the Armory and Gymnasium, authorized by the legislature of 1891, and still nearer the lake is the University Boat House.

GENERAL POLICY.

It is the general policy of the institution to foster the higher educational interests of the State, broadly and generously interpreted. It is its aim to make ample provision for the demands of advanced scholarship in as many lines as its means will permit. By prescribing a large portion of the studies of the regular courses in the earlier years, and by leaving a large number in the later portion to the selection of the student, it endeavors to give a wise measure of direction and at the same time leave sufficient room for choice to encourage individual adaptation and special development.

The University strenuously avoids all that is sectarian or partisan; but it endeavors to extend its sympathy and influence to whatever contributes to good citizenship and high character.

The University recognizes no distinction of race, color, or sex. All who conform to its intellectual and moral requirements are equally entitled to its privileges.

GOVERNMENT.

The government of the institution rests upon the inherent obligations of students. The University is maintained at the public expense for the public good. Those who participate in its benefits are expected, as a matter of honor, not only to fulfill the obligations of loyal members of the institution, of the community, and of the commonwealth, but actively to aid in promoting their intellectual and moral interests. Every student owes to the public a full equivalent for its expenditure in his behalf, in the form of superior usefulness to it, both while in the institution and afterwards. Students therefore cannot claim any peculiar exemption from the duties of good citizens and of loyal members of the community and of the University; on the contrary they are under peculiar obligations loyally to fulfill every duty. As members of the institution, they are held responsible for regular attendance and the proper performance of their duties. The interests of faithful students and the well-being of the University demand that those who do not conform to these manifest obligations should with-

draw from the institution or be excluded. As members of the community, students are amenable to the law; and, if guilty of its infraction, are liable to a termination of their relations with the University. The University recognizes its civic relations and rests its administration upon civic obligations.

The care of the students in their studies is placed in charge of class officers, chosen from the Faculty. Each division of the classes is under such an officer, who directs the work of the students, assigns to each his studies and reports his progress at the end of each term to his parent or guardian. The class officers receive all reports from instructors, both those on work completed at the end of the term and special reports of deficiency or failure on the part of individuals.

METHODS OF WORK.

The methods of work embrace those that have proved efficient in the experience of similar institutions. Recitations, emancipated from servile text-book work, hold a large place. Lectures, especially in the departments admitting of experimental and objective illustration, also occupy a large place. Freedom of discussion and questioning by the student accompany both methods. The laboratory system is fully employed in all the departments in which it is practicable. The seminary system has been introduced into the several departments to which it is adapted.

LIBRARIES.

The General University Library, including the department libraries catalogued therewith, contains over 30,000 books and 8,000 pamphlets. It is open to students every day from 8:45 A. M. to 9:30 P. M., excepting on legal holidays and Sundays. About 200 of the best American and foreign periodicals are taken. In addition there is on deposit the Owen library of works on French literature, numbering about 900 volumes. The College of Law has a special library of 2,300 volumes; and the Washburn Observatory is provided with the Woodman Astronomical Library, now containing 2,200 books and 1,600 pamphlets. Students also have free access to the State Law Library, comprising about 26,000 volumes, and by special arrangements are enabled to take out books from the free library of the City of Madison. This is a well-selected collection of over 13,000 volumes.

The library of the State Historical Society contains about 98,000 volumes and 69,000 pamphlets. It is exceptionally rich in manu-

script and other material for the study of the history of the Mississippi valley. The collections of the late Dr. Lyman C. Draper are included in the library. Its files of newspapers and periodicals are among the most complete in the United States. There are over 5,000 volumes of bound newspapers published outside of Wisconsin, and the files cover, with but few breaks, the period from the middle of the seventeenth century to the present. There is an excellent collection of United States government documents, and the material for the study of American local history, Western travel, the Revolution, Slavery, and the Civil War, is unusually abundant. In English history the library possesses the Calendars of the State Papers, the Rolls Series, and other important collections, including works on local history. The Tank collection (Dutch) offers facilities for the study of the Netherlands. The library of the Historical Society is accessible to all students of the University, and thus affords exceptional facilities for the prosecution of advanced historical work. The Historical Seminary of the University has been generously granted special facilities in the rooms of the library. The Historical, State, University, and City libraries afford duplicate copies of historical material most in use, and to a large extent supplement one another.

During the year 1892–93 the Regents of the University appropriated five thousand dollars for the supply of special works for the use of seminary students in the school of Economics, Political Science, and History. The works supplied by this fund afford good facilities for investigations of an advanced nature.

These library privileges are unsurpassed in the interior, and equaled by very few institutions in the country.

LABORATORIES.

Chemical Laboratories.— The Chemical Laboratories, six in number, are in a building devoted exclusively to Chemistry. Three of these are general laboratories, viz:

First. The Qualitative Laboratory, with accommodations for ninety-six students; *Second.* The Organic Laboratory, accommodating thirty-two students; and, *Third.* The Quantitative Laboratory, accommodating forty-eight students.

These laboratories are large, well-lighted, conveniently arranged, and well supplied with the necessary apparatus and equipments.

Of the three special laboratories, one is for Gas-analysis, one for Urinalysis, and one for Toxicology.

Physical Laboratories.—The instruction in the department of physics is designed to meet the needs of all classes of students, from those just entering, with no knowledge of the subject, to those who have been well trained, and who are now prepared to continue in the more advanced courses or to take up a line of original investigation.

The Physical Laboratories are located on the first floor and in the basement of the south wing of Science Hall, and are commodious and well lighted. Besides the lecture room and large apparatus room, on the first floor are two laboratory rooms for purposes where great steadiness is not required. The lecture room has a seating capacity for 125 students, and is provided with all the appliances to facilitate a complete course of experimental lectures. In the basement are three large general laboratories for under-graduate work, all of which are liberally supplied with piers to insure the perfect stability of the instruments used. There are also in the basement a well equipped photometric room and a number of laboratories devoted to special investigation. On the fourth floor of this building are found a number of rooms which are devoted exclusively to the study of photography. Besides current supplied from the numerous dynamos in the University shops, the various rooms of the physical laboratory are connected with the electric light and power currents of the city.

The physical apparatus includes, in addition to the equipment for demonstration purposes, an excellent collection of instruments adapted to measurement and investigation. The laboratory offers special facilities for carrying out graduate study and research.

The Mineralogical Laboratory.—The Mineralogical Laboratory has reagents and other necessary apparatus for complete courses in blow-pipe analysis and determinative mineralogy. There is a collection of hand specimens of minerals for laboratory use, and for comparative purposes. The students also have access to the large collections in the cabinet. A small room has been fitted with curtains, to act as a goniometer room, and is supplied with a large reflection goniometer and the complete *Universalapparat* of Fuess and a goniometer lamp.

The mineralogical lecture room is supplied with a complete set of about 150 glass crystal models by F. Thomas, of Siegen, a selected series of wooden crystal models from Kranz, of Bonn; Bohm and Wiedermann's wave-surface and dispersion models; Brill's plaster models of surfaces of elasticity, etc.; Werlein's

models to show the characters of dispersion in monoclinic crystals; and a series of axis-systems.

The Petrographical Laboratory.—The Petrographical Laboratory is large and well lighted. It contains at present fourteen microscopes, three by Voigt & Hochgesang, seven by Nachet, and four by Fuess, including one first-class stand by each of the last two. The large Fuess is supplied with an unusually complete set of excellent eye-pieces, objectives, and accessories. The laboratory has heavy liquids for separating rock constituents, and a Westphalen balance to determine their specific gravity. The collections of the laboratory are as follows: About 200 sections of minerals, cut in definite directions, 100 of which are Professor Klein's set as prepared by Voigt & Hochgesang; the Stürz set of European rock specimens and thin sections, known as the Rosenbusch collections; a set of American rocks, accompanied by thin sections, by Julien; and the thin sections of the State Geological Survey. There is also available the very extensive collection of rocks and thin sections from the Pre-Cambrian rocks of North America, belonging to the Lake Superior Division of the United States Geological Survey. This collection is one of the largest of its kind in the world, containing over 10,000 thin sections, and is particularly valuable to advanced students.

The lecture room for geology is provided with a full set of reference manuals; a set of Zittel's Palæontologische Wandtafeln; a large relief map of the United States by E. E. Howells; a set of Shaler's models and photographs; a set of Davis's models showing the development of topographic features; numerous geological maps; a large collection of lantern slides; Newton's large electric projecting lantern, and other apparatus. The Newton lantern is adapted for projecting ordinary lantern slides, and has a front for microscopic slides which projects directly on the screen thin sections of rocks both in the ordinary and polarized light.

The Biological Laboratories.—The elementary laboratory for the departments of botany and zoology is arranged to accommodate seventy-two students, and is provided with compound microscopes, dissecting microscopes, and other apparatus necessary to an elementary course in botany and zoology. The departments have about ninety compound microscopes, chiefly by Leitz and by Bausch & Lomb, fitted for elementary and advanced work, including seven microscopes furnished with oil immersion objectives.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to an advanced course

in vegetable histology, and to a course in vegetable physiology. Among the more important pieces of apparatus are Minot microtomes, a Vogel's direct vision spectroscope, a metallic registering thermometer, clinostats, and auxanometers.

The laboratories for advanced work in zoology are two in number, one being devoted to histology, and the other to verbrate anatomy and embryology. The histological laboratory is provided with a full equipment of the reagents, microtomes of various patterns, and microscopes necessary to a course in histology. The anatomical laboratory is furnished with a collection of vertebrate skeletons and of wax models illustrating the development of some of the more important vertebrates and invertebrates. For illustrating the lectures in botany and in zoology, there are Auzoux models, both of plants and animals, an electric projecting lantern and microscope by Newton & Co., London, over 500 photograms for lantern use, a large number of wall charts, microscope slides, etc.

The Bacteriological Laboratory is situated in Agricultural Hall, and is well equipped with microscopes, sterilizers, thermostats and other apparatus for the study of bacteria. These are chiefly from the manufactories of Rohrbeck & Co., and Muencke of Berlin.

The Psychological Laboratory.—The laboratory is designed to illustrate by practical experiments and demonstrations the courses in psychology; to give an opportunity to students of experimental psychology to study the methods, equipments and results of this promising and rapidly progressing science; and to encourage original research.

Considerable apparatus has been purchased abroad and many pieces have been made at the machine shops of the University.

The equipment includes a very complete series of apparatus for the study of the dermal senses; the typical and important instruments for experiments and demonstration in psychological optics; and an unusual variety of apparatus for the study of the time relations of mental phenomena; considerable apparatus designed for statistical research on simple sense and motor tests; a variety of devices for the study of memory, attention, association, and other more complicated processes, and so on. The laboratory has acquired a considerable number of pieces from the section of psychology at the World's Columbian Exposition, including almost the entire working laboratory there exhibited.

Apparatus belonging to other departments is also available for demonstration and other purposes. Original research has been

carried on for several years and the more important results have been published in the American Journal of Psychology.

In addition to the four series of studies there published, the work done in the laboratory has been the basis of several articles that have appeared or are about to appear in various periodicals.

It is intended to make the laboratory an essential and important feature of the work in psychology.

The engineering, assaying, pharmacy and agricultural laboratories are described under their respective departments.

MUSEUMS.

The Geological and Mineralogical Museum.—The museum of the geological and mineralogical departments occupies the entire south wing of the second floor of Science Hall. Systematic collections of typical and impressive specimens have been arranged in glass cases, while the more extensive series for comparative purposes and the working collections are stored in drawers beneath.

Relief Models.—For illustration in general and structural geology the collection embraces large topographico-geological models of the Colorado Cañon, the Henry Mountains, the Auvergne, the Yosemite Valley, the Uintah Mountains, Mt. Vesuvius, the Leadville Region, etc.

Palæontological Collection.—This embraces a considerable number of Ward and Howell's casts of gigantic fossil forms, including *Megatherium Cuvieri*, *Glyptodon*, the skull and tusks of *Elephas ganesa*, *Dinotherium* and *Mastodon*, and an unusually good set of Mesozoic reptilian forms. The fossils include a systematic collection, embracing all geological horizons, obtained by purchase, and the *Powers Collection*, the generous gift of Mr. H. C. Powers, of Chicago. This latter collection is especially rich in fossils of the Trenton and other Silurian deposits of Wisconsin.

The collection of the Wisconsin Academy of Science, which contains the type specimens described in the official reports of the last State Geological Survey, is deposited in the museum and is accessible to students.

The Mineral Collection.—The systematic collection of minerals contains 2,500 to 3,000 specimens, representing the different groups and containing many rare specimens. With a view to the impressive illustration of mineralogical types, the larger and many of the smaller but choice specimens have been displayed in glass cases.

The Henry Collection of Minerals.—The University Museum contains the W. T. Henry collection, consisting of from 30,000 to 40,000 specimens. It is especially representative of the lead and zinc ore deposits of southwestern Wisconsin and adjoining states, and is exceptionally complete in its exhibition of the various forms of ore, of the order of deposition, and of the pseudomorphic changes that have taken place in the original deposits. Crystallographically the collection is valuable from the specimens of calcite, cerusite, azurite, galena and sphalerite. The large number of duplicate specimens will be utilized in enlarging the collection by exchanges.

Rock Collection.—This collection is now stored in the petrographical laboratory, where it is daily accessible to students. It embraces Stürz's Rosenbusch collection of typical European rocks, and the Julien collection of typical American rocks, as well as a miscellaneous collection obtained from various sources.

Metallurgical Collection.—This collection, illustrating the metallurgy of the different metals, contains specimens representing the ores of each, and the products of the different reducing processes. It has been systematically arranged and placed in the mineralogical lecture room.

The Zoological and Botanical Museum occupies the entire third story of the south wing of Science Hall, directly above the geological museum. Among the specimens at present placed in the cases may be named a good collection of vertebrate skeletons; a large number of Blaschka glass models of invertebrates; an alcoholic collection of invertebrates from the Naples Zoological Station; representative collections of echinoderms, corals and mollusks. The botanical cases contain a collection of Auzoux models of flowers and a collection of specimens of wood. The Owen collection of Lepidoptera, comprising five thousand species, and over twenty thousand specimens, is deposited in Science Hall.

The Herbarium of the University (Room 41, Science Hall) includes the Lapham collection, chiefly of flowering plants, purchased by the State from the estate of I. A. Lapham, of Milwaukee. This contained about 8,000 species. These have been recently mounted and arranged, and are now accessible for consultation. The Wisconsin plants have been separated from the rest, and it is the intention to make them a basis of a complete representation of the Wisconsin flora. The first large addition in this direction has been through the presentation by Mr. L. S. Cheney

of his private collection. Mr. Lapham's collection also included a considerable number of algae, lichens, and mosses. The collection of mosses has now been very greatly extended, so that it includes almost all of the species known in North America, and a large number of those of other countries. Many valuable sets of exsiccati are included.

When the museums are not open to the public, access may be gained by visitors at all reasonable hours by calling upon the janitor of the building, whose room is on the first floor of Science Hall.

THE WASHBURN OBSERVATORY.

The Washburn Observatory is excellently equipped for astronomical work. Its principal instruments are: An equatorially mounted telescope of 15½ inches aperture, constructed by Alvan Clark and Sons, and provided with graduated circles, driving clock, a filar micrometer, and a very complete set of eye-pieces; a meridian circle, by A. Repsold and Sons, of Hamburg, with collimators, and the usual accessories of such an instrument. This instrument is figured in the last edition of the Encyclopædia Britannica as the type of its class. The objective of the instrument was made by the Clarks, and has an aperture of 4.8 inches and a focal length of 58 inches. The circle is graduated to 2'. A floating mirror has been added to this instrument as an auxiliary for the determination of its horizontal points and flexures. There are also a sidereal clock by Höhwü, of Amsterdam, two mean-time clocks by Howard, of Boston, all excellent time-pieces, and a chronograph, by Fauth & Co., of Washington.

In the Students' Observatory are mounted a six-inch equatorial telescope, by Alvan Clark and Sons, a combined transit and zenith telescope, by Fauth & Co., and a transit instrument of the broken telescope type, by Bamberg. These instruments, while primarily intended for instruction, are well adapted to and are employed for certain classes of original work. In particular, the equatorial telescope has been provided with reflecting prisms (Loewy), and employed as one of the principal instruments of the Observatory in an investigation of the refraction and the constant of aberration, and the Bamberg instrument is used for latitude determinations by the Talcott method. The Observatory also possesses a considerable number of subsidiary instruments, such as chronometers, sextants, an altazimuth, a

universal instrument of the German type, a spherometer caliper, seismoscopes, and a complete set of meteorological instruments.

The Woodman Astronomical Library, established in connection with the Observatory, possesses a large and valuable collection of works upon astronomy and kindred subjects.

The working force of the Observatory has for some years been largely devoted to the determination with the meridian circle of accurate positions of the fundamental stars, including a study of the errors of the instruments and a precise determination of the latitude of the Observatory.

The large equatorial has been employed in the measurement of double stars, variable stars and the occasional observation of planets, comets, and phenomena of current interest.

Meteorological observations are regularly taken and communicated to the Weather Bureau at Washington.

Students of sufficient technical attainments are admitted to the Observatory, and take part in the investigations in progress. Meritorious original work of such students will be included in the publications of the Observatory.

Publications.

By provision of law the results of important investigations conducted at the Washburn Observatory are published by the State, and under this provision eight volumes, representing the more important work done at the Observatory, have been issued.

PHYSICAL TRAINING.

Military drill is required of the young men of the Freshmen and Sophomore classes, and of special students of the first two years' attendance. The lower campus, a level area, furnishes space for base ball, foot ball, and other physical sports. Tennis courts are also provided. The University is situated on the shores of Lake Mendota, a beautiful sheet of water, which invites exercise and recreation in boating. The University Boat House Association has erected a boat house at a cost of over $4,000.

New Armory and Gymnasium.

Through the liberal appropriation made by the legislature of 1891, means were provided for the construction of a new Armory and Gymnasium of the most approved order. The building is two hundred feet in length, ninety-eight feet in width, and three stories in height. On the ground floor there are ample accom-

modations for bathing, including a swimming tank eighty feet in length by twenty-eight in width, a room for squad and company drill, lockers for six hundred students, four bowling alleys, and room for the practice of the minor gymnastics. On the main floor, besides the necessary offices, there is an unobstructed hall one hundred and sixty-two by ninety-three feet in dimensions, for the purposes of military drill and gymnastic practice. On the third floor are two rifle ranges, a running track, a base ball cage one hundred and sixty feet in length, and two rooms of same length for rowing machines and similar apparatus.

Gymnastics for Women

Systematic courses in gymnastics for women are maintained in Ladies' Hall under the immediate direction of a trained instructor, a graduate of Allen's Gymnasium of Boston, and under the general supervision of a thoroughly educated physician.

DEGREES.

FIRST DEGREES.

The baccalaureate degrees are conferred at graduation upon those who have successfully completed the regular courses leading to degrees, and who have conformed with the requirements of the University. The degrees for the several courses are as follows:

Academic.

BACHELOR OF ARTS, for the Ancient Classical Course.
BACHELOR OF SCIENCE, for the General Science Course.
BACHELOR OF LETTERS, for the Modern Classical, the English, and the Civic-Historical Courses.

Professional.

BACHELOR OF LAWS, for the Law Course.
GRADUATE IN PHARMACY, for the Pharmaceutical Course.
BACHELOR OF SCIENCE IN PHARMACY, for the Four Years' Pharmacy Course.

Technical.

BACHELOR OF SCIENCE IN AGRICULTURE, for the Agricultural Course.
BACHELOR OF SCIENCE IN ENGINEERING, for the courses in Civil Engineering, Mechanical Engineering, Mining and Metallurgical Engineering, Electrical Engineering.

A graduate of any one of the courses may receive the baccalaureate degree of any other course by completing the additional studies required in that course, but two baccalaureate degrees cannot be taken in one year.

SECOND DEGREES.

The degrees of Master of Arts, Master of Letters and Master of Science are conferred upon graduates of the University who have previously taken the degrees of Bachelor of Arts, Bachelor of Letters and Bachelor of Science respectively, and who, after graduation, have pursued an approved course of study equivalent to the work of one year of graduate studies in the University and who present a satisfactory thesis upon the leading subject pursued. This work may be done at the University or elsewhere, but if it is not

done at the University, or in connection with some institution of high rank, it will be assumed that a longer time and a larger nominal amount of study will be requisite to give the equivalent attainment, and the degree will not be conferred until three years after graduation. The work must consist of one major and one minor subject, must be in the general line of advanced study implied by the degree sought, and must be approved by the Committee of the Faculty having the subject in charge. Two thirds of this study must be devoted to the major subject and one third to the minor. Study for a profession will not be accepted, but original investigation in connection with a profession, or special and scholarly study collateral to it, may be accepted, in the discretion of the Faculty. A thesis showing creditable original research must be presented at least one month before the close of the academic year, and if the thesis is satisfactory an examination is required before a committee of the Faculty on the major and minor subjects.

Graduates of this or of similar institutions who pursue the course in law at the University, and who, by reason of their superior training, are able to take additional studies advantageously, may receive a second degree on graduation from the Law School on condition of having satisfactorily pursued graduate studies equivalent to five hours a week during the two years of their course, and by conforming to the other required conditions.

The degrees of Civil Engineer, Mechanical Engineer, Mining Engineer, Metallurgical Engineer and Electrical Engineer are conferred as second degrees upon Bachelors of Science in the Civil, Mechanical, Mining and Metallurgical and Electrical Engineering Courses respectively, (1) who pursue advanced professional study at the University for one year, and present a satisfactory project or thesis; or (2) who present suitable evidence of three years of professional work, of which one must be in a position of responsibility, and present a satisfactory thesis.

The degree of Master of Pharmacy will be conferred upon Graduates in Pharmacy who satisfactorily complete a course of one full year (three terms) at the University in advanced pharmacy, or in some science or sciences specially allied to pharmacy, and who shall present a satisfactory thesis embodying the results of original investigation.

The University offers its higher degrees to graduates of other colleges of high standing who shall reside at the University and pursue the requisite studies under the immediate direction of the Faculty.

The Committees on second degrees are as follows:

For the degree of M.A., Professors Kerr and Hendrickson.

For the degree of M.L., Professors Parkinson, Freeman, and Stearns.

For the degree of M.S., Professors Daniells and Birge.

For all the second degrees in Engineering, the Engineering Board.

For higher degrees in Pharmacy, Professors Kremers and Daniells.

THIRD DEGREES.

The degree of Doctor of Philosophy will be conferred upon successful candidates after three years of graduate study, of which the last year or the first two years must be pursued at this University. This degree will not, however, be conferred simply on the ground of the completion of study for the prescribed length of time. Special attainments are requisite; particularly the power of original thought and independent investigation. The candidate will be examined on three subjects, one major and two minors, which must be chosen with the approval of the proper committee of the Faculty as early as the beginning of the year in which the candidate expects to take the degree. A thesis must be presented which shall give evidence of original research and independent treatment. The applicant must announce himself as a candidate at least as early as the beginning of his last year of study, and his thesis must be placed in the hands of the appropriate committee of the Faculty at least two months before the close of the academic year. The subject of the thesis must have the approval of the head of the department in which the major subject is carried on as early as November 1st of the collegiate year in which the candidate expects to take his degree. In case the candidate is successful, he is required to put his thesis into print and deposit twenty-five copies of the same in the Library of the University.

HONORS.

HONORS IN SPECIAL STUDIES.

Honors are given at graduation for special work of high order of excellence done in any department. Such honors will be voted by the Faculty to those students whose graduation theses show exceptional excellence and who have completed with unusual success a long course of study in the department in which the thesis is presented. Students desiring to become candidates for special honors in any department must make application to the Faculty at the opening of the winter term through the professor in whose department the honors are sought.

UNIVERSITY FELLOWSHIPS.

For the purpose of promoting higher scholarship and more extended original study than the academic courses afford, the Board of Regents has established eight University Fellowships of $400 each.

The following are the regulations respecting these fellowships:

1. Any fellowship to which the present regulations apply may be held by any graduate of a college of recognized standing or any one whose education is equivalent to that represented by a college degree. Those about to take such a degree are eligible as candidates, the regulations applying to the time of entrance upon the duties of the fellowship. The sexes are equally eligible.

2. Fellowships will be granted upon application only; such application, with accompanying evidence of merit, attainment, and ability, to be in the hands of the President before May 1st of the collegiate year preceding that during which the fellowship is held.

3. All fellowships will be filled each year. Fellows may be re-elected for one additional year only.

4. Applications must be accompanied by evidence of scholarship, ability, and general worthiness; such as theses (whether prepared for this or other purposes), published writings, testimonials from instructors, outline of educational course pursued, special distinctions gained, and the like. Applications for re-appointment should contain a full account of the work of the preceding year. Applications to receive attention must contain a definite statement of the special studies which the applicant intends to pursue.

5. The fellowships will be assigned to the several departments according to the studies which the fellows intend to pursue.

6. Each fellow shall pursue his studies under the direction of the professor or professors in charge of his special studies. Assignment

of University services to the fellows shall be made by the President in consultation with the head of the department to which the fellow has been assigned, and the work assigned may be equivalent to one hour of teaching daily, or the supervision of laboratory work for two hours daily.

7. At a meeting of the Faculty in the month of May (which meeting shall be duly announced as the meeting for the election of fellows), the President shall call upon the several heads of the departments in which applications have been received to make a statement of the merits of the candidates in their departments; after all such statements have been made, the members of the Faculty will then cast their ballots for as many candidates as there are fellows to be elected, and those receiving the highest number of votes (provided that each receive a majority of the votes cast) shall be recommended to the Board of Regents for appointment to fellowships.

Vacancies in fellowships due to resignation or other cause may be filled as they occur at the option of the Faculty.

ALUMNI FELLOWSHIP.

The University records, with pleasure, the establishment of a ninth fellowship by the Alumni of the University. The Alumni Association, at its meeting in June, 1893, voted to found an Alumni Fellowship of the annual value of four hundred dollars. For the present year the fellowship is assigned to the department of Philosophy, and is held by Mr. H. H. Jacobs of the class of 1893.

SCHOLARSHIPS.

The John A. Johnson Scholarships.

The University is indebted to the liberality of the Hon. John A. Johnson, of Madison, for ten scholarships of the annual value of about $35 each, established under the following conditions:

The sum received by one student in one year shall not exceed $50, nor the sum received during his college course exceed $200. Until the year 1900 the sum will be limited to students speaking one of the Scandinavian languages (Norse, Swedish, Danish, or Icelandic). No student can receive aid from this fund unless he has attended a common school one year, or has attended the University one year. The recipient of aid will be expected to return the money received by him to the fund, if he shall at any time be able to do so. The income of the fund will be dispensed by a committee of the Faculty. This committee consists of the President of the University and Professors Olson and Bull.

UNIVERSITY EXTENSION.

The extra-collegiate work of the University assumes two phases: First, the industrial or professional; second, the cultural. The first embraces the Farmers' Institutes and the Teachers' Institute lectures. The work of the former of these will be found set forth under the College of Agriculture; the latter consists of about forty lectures given annually at as many different teachers' institutes held in various portions of the state. These lectures aim to promote advanced work in the teacher's profession, and at the same time foster higher and broader educational views among the people.

The other phase of the work takes the form of University Extension. At the opening of the year 1893–4, thirty-seven courses of six lectures each were offered, as follows:

English School of Philosophy; History of Ethics; Æsthetics, by Prof. J. W. Stearns.

English Literature; Shakespeare, by Prof. J. C. Freeman.

English Poets and the French Revolution, by Mr. J. F. A. Pyre.

Early Scandinavian History and Literature, by Prof. J. E. Olson.

Greek Literature, by Prof. A. Kerr.

Greek Life, by Prof. F. L. Van Cleef.

Socialism; Distribution of Wealth, by Prof. R. T. Ely.

Colonization of North America; United States Politics, 1789–1840, by Prof. F. J. Turner.

English Constitution; Practical Economics, by Prof. J. B. Parkinson.

European History in the Nineteenth Century, by Prof. V. E. Coffin.

Economic Problems of the Day; Money and Credit, by Prof. W. A. Scott.

The Making of Wisconsin, by Mr. R. G. Thwaites.

The History of England, by Mrs. Anna R. Sheldon.

Women's Place in Social Economics: The Ethics of Domestic Science, by Mrs. Helen Campbell.

Public Finance, by Mr. C. J. Bullock.

Oratorical Delivery; Phonetics, by Mr. G. W. Saunderson.

Bacteriology, by Prof. E. A. Birge and by Dr. H. L. Russell.

Physiology of Plants, by Prof. C. R. Barnes.

Geology, by Mr. G. E. Culver.

Physiology, by Dr. John M. Dodson.

Chemistry, by Prof. H. W. Hillyer.

Chemistry of the Alkaloids and Ptomaines; Chemistry of Camphors and Terpenes, by Prof. E. Kremers.

Astronomy, by Prof. G. C. Comstock.

Courses were given in the following places during the year 1892-3: Milwaukee, 6; Chicago, Ill., 4; Galesburg, Ill., 3; Oshkosh, Platteville, Racine, La Crosse, Lake Mills, two each; Baraboo, Belleville, Chippewa Falls, Eau Claire, Fond du Lac, Grand Rapids, Marshfield, Minneapolis, Minn., Neenah, Sheboygan, Sparta, Stevens Point, Washburn, Wausau, West Superior, Weyauwega, Winona, one each.

Besides these regular courses of University Extension lectures, Mrs. Anna R. Sheldon conducted study classes for women in the History of the Middle Ages, France, and England; giving four courses in Madison, three in Milwaukee, and one in Kenosha.

Various methods were employed by the local organizations to meet the expenses of the course. In most cases a moderate fee was charged, and this, with few exceptions, was found sufficient to meet the entire expenses, and in most instances some residue remained. The charges for the courses are $90 for the six lectures, together with the necessary traveling expenses of the lecturer. A synopsis of the lectures is furnished gratuitously to each member of the class.

COLLEGE OF LETTERS AND SCIENCE.

CORPS OF INSTRUCTION.

C. K. ADAMS, LL.D., President of the University.
E. A. BIRGE, PH.D., Dean and Professor of Zoology.
C. R. BARNES, PH.D., Professor of Botany.
J. M. CLEMENTS, PH.D., Assistant Professor of Geology.
VICTOR COFFIN, PH.D., Assistant Professor of European History.
G. C. COMSTOCK, PH.B., LL.B., Professor of Astronomy.
W. W. DANIELLS, M.S., Professor of Chemistry.
J. E. DAVIES, A.M., M.D., LL. D., Professor of Electricity and Magnetism and Mathematical Physics.
R. T. ELY, PH.D., LL.D., Professor of Political Economy.
D. B. FRANKENBURGER, A.M., Professor of Rhetoric and Oratory.
J. C. FREEMAN, LL.D., Professor of English Literature.
ALMAH J. FRISBY, B.S., M.D., Preceptress and Professor of Hygiene.
C. H. HASKINS, PH.D., Professor of European History.
G. L. HENDRICKSON, A.B., Professor of Latin.
H. W. HILLYER, PH.D., Assistant Professor of Organic Chemistry
W. H. HOBBS, PH.D., Assistant Professor of Mineralogy and Petrology.
F. G. HUBBARD, PH.D., Assistant Professor of English Literature.
JOSEPH JASTROW, PH.D., Professor of Experimental and Comparative Psychology.
ALEXANDER KERR, A.M., Professor of the Greek Language and Literatures.
A. A. KNOWLTON, A.M., Assistant Professor of Rhetoric.
H. J. MCGRATH, Professor of Military Science and Tactics.
J. E. OLSON, B.L., Professor of Scandinavian Languages and Literature.
E. T. OWEN, A.B., Professor of the French Language and Literature.
F. A. PARKER, Professor of Music.
J. B. PARKINSON, A.M., Professor of Constitutional and International Law.
W. H. ROSENSTENGEL, A.M., Professor of the German Language and Literature.

H. L. Russell, Ph.D., Assistant Professor of Bacteriology.
W. A. Scott, Ph.D., Associate Professor of Political Economy.
C. S. Slichter, M.S., Professor of Applied Mathematics.
B. W. Snow, Ph.D., Professor of Physics.
J. W. Stearns, LL.D., Professor of Philosophy and Pedagogy.
F. J. Turner, Ph.D., Professor of American History.
F. L. Van Cleef, Ph.D., Professor of Greek.
C. R. Van Hise, Ph.D., Professor of Geology.
C. A. Van Velzer, Ph.D., Professor of Mathematics.
F. H. Wilkens, Ph.D., Assistant Professor of German Philology.
W. H. Williams, A.B., Professor of Hebrew and Hellenistic Greek.

D. Anderson, B.S., Assistant in Chemistry.
L. W. Austin, Ph.D., Instructor in Physics.
Clara E. S. Ballard, Instructor in Gymnastics.
W. B. Cairns, A.M., Instructor in Rhetoric.
L. S. Cheney, B.S., Instructor in General and Pharmaceutical Botany.
Lucy M. Gay, B.L., Instructor in French.
W. F. Giese, A.M., Instructor in Romance Languages.
L. Kahlenburg, M.S., Instructor in Chemistry.
W. S. Marshall, Ph D., Instructor in Biology.
W. S Miller, M.D., Instructor in Vertebrate Anatomy.
J. F. A. Pyre, B.L., Instructor in English Literature.
Harriet T. Remington, M.L., Instructor in German.
G. W. Saunderson, A.M., LL.B., Instructor in Elocution.
F. C. Sharp, Ph.D., Instructor in Philosophy.
W. G. Sired, Instructor in Music.
E. B. Skinner, A.B., Instructor in Mathematics.
H. A. Sober, A.B., Instructor in Latin.
Susan A. Sterling, B.L., Instructor in German.
E. B. Van Vleck, Ph.D., Instructor in Mathematics.

ADMISSION TO THE FRESHMAN CLASS OF THE UNIVERSITY.

There are three methods of admission to the University:

I. By examination at the University.
II. By special local examinations under the supervision of an authorized agent of the University; and
III. By certificates from accredited schools.

I. Examinations at the University.

The regular examinations of the University are two in number; one in June and one in September. The earlier one is intended for those who wish to be examined while fresh from their preparatory studies and thus to set at rest all doubt as to their admission; and for those who wish to test their qualifications at an early date that they may have time to make up deficiencies if necessary. The September examination immediately precedes the opening of the fall term.

For the current year the earlier examinations will be held on Thursday and Friday, June 14th and 15th, beginning at 9 o'clock A. M. The later examinations will be held on Tuesday and Wednesday, September 11th and 12th, beginning at 9 o'clock A. M. Students who are in any doubt as to their qualifications are urged to present themselves in June. All candidates are required to be present at nine o'clock on the first day of the examinations.

Examinations will also be held on the opening day of the winter and the spring terms, but to be admitted, students must not only pass the entrance examinations but also must satisfy the examiners of their ability to pursue advantageously the studies of the classes which they propose to enter.

The examinations will cover the following topics:

GROUP I. *Subjects required of all candidates:*

a. **Geography**, political and physical.

b. **History of the United States**: Montgomery's or Johnston's History of the United States, or an equivalent.

c. **Arithmetic.**

d. **Algebra**: through quadratic equations, theory of indices and radicals; as much as is contained in the corresponding parts of Van Velzer and Slichter's School Algebra, Wentworth's School Algebra or Elements of Algebra, Hall and Knight's Elementary Algebra, C. Smith's Elementary Algebra, Todhunter's Algebra for Beginners, Wells' Elementary Algebra, or Sheldon's Ele ments of Algebra.

Geometry: Wentworth's or Chauvenet's, plane, solid, and spherical.

English: 1. An analysis of short extracts from prose and poetry, as to forms and meanings of words, structure of sentences, paragraphing and figures of speech.

2. Each candidate will be required to write a short essay on a subject to be announced at the time of the examination. The essay will be taken as a test of a candidate's knowledge of spelling, punctuation, use of capital letters, grammar, structure of sentences, and paragraphs. The subjects will be selected from the following works. It is expected

that the student by careful reading will make himself familiar with the characters, incidents, and plots:

1894 — Shakespeare's Julius Cæsar and Merchant of Venice, Scott's Lady of the Lake, Addison's Roger de Coverley papers, Macaulay's second essay on the Earl of Chatham, Emerson's American Scholar, Irving's Sketch Book, Dicken's David Copperfield.

1895 — Shakespeare's Merchant of Venice and Twelfth Night, Milton's L' Allegro, Il Penseroso, Comus, and Lycidas, Longfellow's Evangeline, Addison's Roger de Coverley papers, Macaulay's essay on Milton and essay on Addison, Webster's first Bunker Hill Oration, Irving's Sketch Book, Scott's Ivanhoe.

It is recommended, (1) that the pupil use annotated editions of the above, which are now furnished by several publishers at very reasonable prices; (2) that the pupil make daily use of the unabridged dictionaries; (3) that a review of the principles of English grammar be taken in the latter part of the preparatory course; (4) that in the reading of the above works the pupil have regard to the principles of rhetoric; (5) that the pupil present weekly exercises in original composition during the latter half of the preparatory course. The themes of the compositions should be taken from the above works or from other subjects which he is studying.

GROUP II. *Requirements for admission to the Ancient Classical Course.*

a. The studies enumerated in Group I.

b. **Latin:** Grammar; Reader; Cæsar, four books; Cicero, seven orations; Virgil, six books; Composition, forty lessons of Jones's Composition, or an equivalent.

c. **Greek:** Grammar; Lessons; Xenophon's Anabasis, four books; Homer's Iliad, three books, or an equivalent amount of Xenophon's prose; Greek composition.

d. **Ancient History:** Myers' and Allen's Ancient History; Myers' Ancient History, or a substantial equivalent.

e. **English History:** Gardiner's English History for Schools, or Montgomery's Leading Facts of English History.

GROUP III. *Requirements for admission to the Modern Classical Course.*

a. The studies enumerated in Group I.

b. **Latin** as stated in Group II., b.

c. **History** as stated in Group II., d., e.

d. German: Correct pronunciation, the essentials of grammar (Collar-Eysenbach's, Joynes-Meissner's, Whitney's or an equivalent), and the ability to apply them (two terms' work); acquisition of a vocabulary sufficient to enable students to read and translate sixty reading lessons in any standard reader correctly and understandingly; practice in the oral use of German in connection with the reading lessons, and the memorizing of from 9 to 12 German poems (two terms' work), and the careful study of at least two plays, as Minna von Barnhelm, Der Neffe als Onkel, or Die Journalisten (two terms' work).

GROUP IV. *Requirements for admission to the General Science Course, and to all the Courses in Engineering.*

a. The studies named in Group I.

b. German as stated in Group III., d, or an equivalent amount of French.

c. Physics: Gage or Avery, with laboratory work.

d. Physiology: Martin's The Human Body (briefer course).

e. Botany: Gray's Lessons, with plant analysis and description.

f. Adaptive Work, amounting to one daily recitation for two years.

This may consist of various subjects. The University advises:

1. Two years' daily work in French or Latin; or,
2. One year's work in history, equivalent to that stated in Group II., d; and

   One year's work in English literature, as stated in Group V., c.

   If these studies cannot be taken, a selection from the following studies may be offered:
3. Rhetoric, Civil Government, Mental Science, Theory and Art of Teaching, Zoology, Astronomy, or other science. No subject can be offered which has been pursued in high school for a shorter time than twelve weeks, or which is less in amount than a standard high school text-book on the subject. The total amount offered must be equivalent of a daily recitation for two years. The two years' work may be made up of these studies in any combinations, under the conditions stated above.

GROUP V. *Requirements for admission to the Civic-Historical and English Courses:*

a. The studies named in Group I.

b. History as prescribed in Group II., d, e.

c. **English Literature**: Reed and Kellog's Manual; Careful study of representative writers. The whole to be equal to a daily recitation for one year.

d. **Science** as prescribed in Group IV., c, d, e.

e. **Adaptive work** as stated in Group IV., f.

Students entering these courses are advised to present either Latin, French or German as their adaptive work. Candidates not presenting any foreign language are urged to make a thorough review of English grammar. Experience has shown that a not inconsiderable number of students fail in French and German at the University from deficient preparation in English grammar.

Change of Terms of Admission to the Civic-Historical Course.

In 1895 the terms of admission to the Civic-Historical Course will be changed, so as to agree with those now demanded of candidates for the Modern Classical Course; except that an equivalent amount of history, English literature, or science as now required for the Civic-Historical Course may be substituted for German.

Real equivalents will be accepted for the requirements given above. Students desiring admission into any course must present those requirements which are essential to the work of the course.

Conditions in entrance examinations will be limited to those cases in which the Board of Examiners think that the maturity and strength of the student will allow him to carry the regular work of his course and make up the conditions.

Admission to the Elementary Greek Class.

As Greek is given in but few high schools, a special concession is made to those who wish to take the Ancient Classical Course in the University. An Elementary Greek Class is provided, for admission to which Greek will not be required. In Latin, four books of Cæsar and four orations of Cicero will be required. Otherwise the requirements will be the same as for the Ancient Classical Course. This preparation may be secured by taking the Modern Classical Course recommended by the State Superintendent through the first three years, substituting geometry in the place of German in the third year. Students who thus take the elementary Greek in the University must expect to take five years for completing the Ancient Classical Course.

Admission of Special Students.

Candidates under twenty-one years of age desiring to take special courses will be required to present the same qualifications as candidates for one of the regular courses.

Persons twenty-one years of age, who are not candidates for a degree, and who wish to take special studies, will be permitted to do so upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree, or to take a regular course, they must pass the required entrance examinations.

II. Admission by Special Local Examinations.

To save expense and embarassment to those who live at a considerable distance from the University, special local examinations will be given when satisfactory arrangements can be made. Upon request, questions will be sent to any principal or county superintendent who will consent to supervise the examination for the accommodation of the candidate. The questions are to be submitted under the usual restrictions of a written examination, and the answers returned to the University accompanied by the indorsement of the principal or superintendent that the examination has been properly made. The student desiring to take advantage of this provision must secure the consent of the proper person to take charge of the examination, and make request to the President of the University to have the questions sent. The proper time for such an examination is that of the earlier examination of the University, June 14–15. Exceptions may be made for special reasons. It is very desirable, however, that all papers should be returned to the University before Commencement, as the professors in charge of examinations may be absent after that event. No papers will be sent out after June 13.

III. Admission Upon Certificate.

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 the University may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a representative of the University. Application for such an examination may be made by an officer of the school to the President of the University, on the basis of which a representative of the University will examine the course of study and the meth-

ods of instruction of the school, and on his favorable recommendation, and the concurrence of the Faculty, it will be entered upon the accredited list of the University. No school will be placed upon the list whose course of study is not fully equal to the four-year course for high schools recommended by the State Superintendent. The *graduates* of such an approved school will be received by the University, on presentation of a proper certificate, into any of its courses for which they have been fitted. Students of an 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 University 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. The necessary expenses attending the visit of the representative of the University are to be met by the school under examination.

Principals of accredited schools are requested to note the statements regarding English, German, and adaptive work under Terms of Admission, pp. 42–44; and their attention is directed especially to the change in terms of admission to the Civic-Historical Course after 1895.

*ACCREDITED HIGH SCHOOLS.

For All Courses.

Beloit High School	A. J. ROTE, Principal.
Chicago (Ill.) High School . .	A. G. LANE, Superintendent.
Fond du Lac High School . .	E. MCLOUGHLIN, Principal.
La Crosse High School . . .	ALBERT HARDY, Principal.
Madison High School . . .	J. H. HUTCHINSON, Principal.
Marinette High School . . .	J. F POWELL, Principal.
Milwaukee High School . .	A. J. ROGERS, Principal.
Monroe High School	J. A. MITCHELL, Principal.
Oshkosh High School . . .	R. H. HALSEY, Principal.
Rockford (Ill.) High School .	WALTER A. EDWARDS, Principal.

*As the catalogue is published earlier this year than usual, several high schools whose administration has recently changed still remain to be inspected. These schools are retained on the accredited list provisionally, until an inspection can be made.

For Modern Classical, General Science, English, Engineering, Pharmacy, and Agricultural Courses.

Austin (Ill.) High School	B. F. Buck, Principal.
Baraboo High School	E. C. Wiswall, Principal.
Brodhead High School	E. E. Campbell, Principal.
Burlington High School	A. Corstvet, Principal.
Chippewa Falls High School	R. L. Barton, Principal.
Darlington High School	J. T. Hooper, Principal.
Decorah (Iowa) High School	S. S. Townsley, Principal.
De Pere High School	C. H. Burgess, Principal.
Dodgeville High School	George Beck, Principal.
Eau Claire High School	M. S. Frawley, Principal.
Elkhorn High School	J. T. Edwards, Principal.
Freeport (Ill.) High School	W. D. Hawk, Principal.
Janesville High School	D. D. Mayne, Principal.
Lake Geneva High School	A. F. Bartlett, Principal.
Lancaster High School	L. L. Clarke, Principal.
Menomonie High School	J. E. Hoyt, Principal.
Neillsville High School	E. B. Oakley, Principal.
Prairie du Chien High School	W. A. Hodge, Principal.
River Falls High School	H. L. Wilson, Principal.
Sheboygan High School	J. E. Riordan, Principal.
Waupaca High School	F. A. Lowell, Principal.
West Superior High School	H. S. Langley, Principal.
Whitewater High School	E. W. Walker, Principal.

For Modern Classical, General Science, Engineering, Pharmacy, and Agricultural Courses.

Appleton High School	F. E. McGovern, Principal.
Beaver Dam High School	H. B. Hubbell, Principal.
Delavan High School	C. W. Rittenburg, Principal.
Evansville High School	L. E. Gettle, Principal.
Fort Atkinson High School	Dwight Kinney, Principal.
Green Bay High School	F. W. Meisnest, Principal.
Neenah High School	J. F. Conant, Principal.
Prescott High School	J. Goldsworthy, Principal.
Racine High School	A. J. Volland, Principal.
Sparta High School	J. W. Livingston, Principal.
Stevens Point High School	H. A. Simonds, Principal.
Tomah High School	G. W. Reigle, Principal.
Viroqua High School	Taylor Frye, Principal.
Watertown High School	C. F. Viebahn, Principal.
West De Pere High School	C. C. Parlin, Principal.

For General Science, English, Engineering, Pharmacy, and Agricultural Courses.

Ashland High School	C. M. Gleason, Principal.
Boscobel High School	L. L. Lightcap, Principal.
Centralia High School	G. W. Paulus, Principal.
Columbus High School	M. H. Jackson, Principal.
Edgerton High School	F. F. Showers, Principal.
Fox Lake High School	W. N. Parker, Principal.
Galena (Ill.) High School	L. DeGraff, Principal.
Grand Rapids High School	W. H. Luehr, Principal.
Hudson High School	E. P. Frost, Principal.
Kenosha High School	Francis Cleary, Principal.
Lodi High School	R. E Loveland, Principal.
Mayville High School	L. S. Keeley, Principal.
Mazomanie High School	R. F. Skiff, Principal.
Menasha High School	A. B. Dunlap, Principal.
New Lisbon High School	G. H. Landgraf, Principal.
New London High School	J. C. Freehoff, Principal.
Ripon High School	A. E. Schaub, Principal.
Sauk City High School	J. S. Roeseler, Principal.
Shullsburg High School	M. M. Warner, Principal.
Wausau High School	Karl Mathie, Principal.
Wauwatosa High School	A. W. Smith, Principal.
West Bend High School	L. E. Amidon, Principal.

For General Science, Engineering, Pharmacy, and Agricultural Courses.

Mineral Point High School	A. R. Jolley, Principal.
Portage High School	W. G. Clough, Principal.
Poynette High School	A. C. Piper, Principal.

For English, Agricultural, and Pharmacy Courses.

Arcadia High School	J. I. Jegi, Principal.
Argyle High School	R. H. Mueller, Principal.
Black River Falls High School	J. H. Derse, Principal.
Durand High School	J. W. Nesbit, Principal.
Elroy High School	H. B. Lathe, Principal.
Hartford High School	E. W. Pryor, Principal.
Horicon High School	E. T. Johnson, Principal.
Jefferson High School	I. Peterson, Principal.
Kewaunee High School	M. McMahon, Principal.

Lake Mills High School	A. B. West, Principal.
Mauston High School	W. L. Morrison, Principal.
Necedah High School	William F. Sell, Principal.
New Richmond High School	J. W. T. Ames, Principal.
Oconomowoc High School	O. J. Schuster, Principal.
Oregon High School	Wm. F. Thiel, Principal.
Reedsburg High School	J. E. NeCollins, Principal.
Richland Center High School	Philip Eden, Principal.
Sharon High School	G. W. Bliss, Principal.
Shawano High School	W. H. Hickok, Principal.
Spring Green High School	J. D. Rouse, Principal.
Stoughton High School	A. H. Sholtz, Principal.
Sturgeon Bay High School	E. E. Beckwith, Principal.
Sun Prairie High School	James Melville, Principal.
Washburn High School	H. W. Rood, Principal.
Waterloo High School	J. G. Adams, Principal.
Waupun High School	F. C. Howard, Principal.

ACCREDITED ACADEMIES AND OTHER INSTITUTIONS.

Carroll College (Waukesha)	W L. Rankin, Principal.
Detroit School for Boys	Frederick Whitton, Principal.
Evansville Seminary	J. E. Coleman, Principal.
Harvard School (2101 Indiana Ave., Chicago, Ill.)	J. J. Schobinger and J. C. Grant, Principals.
Hillside Home School	Miss Ellen C. Lloyd Jones and Miss Jane Lloyd Jones, Principals.
Kenwood Institute (5001 Lake Ave., Chicago, Ill.)	Miss Anna E. Butts, Principal.
Milwaukee Academy	Julius H. Pratt, Principal.
Racine Academy	W W Rowlands, Principal.
Shattuck School (Faribault, Minn.)	E. W. Whipple, Headmaster.
St. Clara's Academy (Sinsinawa)	The Dominican Sisters.
St. Monica School (Fond du Lac)	Mrs. M. E. Bennett, Principal.
Stoughton Academy	K. A. Kasberg, Principal.
Wayland Academy (Beaver Dam)	H. J. Vosburgh, Principal.
Wisconsin Academy (Madison)	Miss C. E. Richmond, Principal.

GRADUATES OF THE STATE NORMAL SCHOOLS.

Graduates of the advanced course of the State normal schools will be admitted to the University with the rank of Juniors in the English and General Science courses. A special adaptation of these courses has been framed for the purpose of enabling such graduates to utilize as advantageously as practicable their previous training. This has been done in view of the ill-adjustment of the courses of normal schools to the regular college courses, and in recognition of the excellent training given in the Wisconsin normal schools.

These courses are presented on a subsequent page, and the attention of the normal school graduates is invited to them.

The certified standing of any student in the regular courses of the normal schools of this State will be accepted in the studies which it covers in place of an examination.

STUDENTS FROM OTHER COLLEGES AND UNIVERSITIES.

Students from other institutions, who have pursued standard college courses equivalent to those of this University, will be admitted to a like standing upon the presentation of proper certificates of creditable standing and honorable dismission. Students of other colleges of good standing who have not taken such standard courses, but who have studied one year in the college proper, may be admitted to the University as special students without examination, or, upon such an examination as may be necessary to determine their attainments, they may be admitted to any course or to any class for which they are found fitted. Students coming from other institutions are advised to bring authenticated records of their standing. In all cases of reasonable ground for doubt, the University reserves the right to test the value of such records by actual examination.

No person will be admitted to advanced standing later than October 1st of the year in which he expects to graduate.

GRADUATE STUDENTS.

Graduates of this University and other colleges and universities of good standing are admitted to graduate courses without examination.

GRADUATE DEPARTMENT.

The University of Wisconsin now affords unusually excellent facilities for the pursuit of advanced studies of original work in several important lines and fair facilities in others. For several years past the University has been adding rapidly to its appliances for advanced work, and larger additions will be made in future.

Attention is invited to the School of Economics, Political Science, and History, under the direction of Dr. Richard T. Ely. This school presents unusual advantages for advanced study and original research in economic, civic, social, and historical subjects. Further information may be obtained from Prof. Richard T. Ely relative to the school in general and economics in particular; from Prof. J. B. Parkinson, relative to political science; and from Prof. F. J. Turner and Prof. C. H. Haskins, relative to history.

For special information regarding courses and facilities in other departments of graduate study, inquiry is invited as follows:

In Philosophy, of Prof. J. W Stearns.

In Comparative and Experimental Psychology, of Prof. Jos. Jastrow.

In Greek Literature, of Prof. Alex. Kerr.

In Greek Philology, of Prof. F. L. Van Cleef.

In Latin, of Prof. G. L. Hendrickson.

In Hebrew, of Prof. W. H. Williams.

In French, of Prof. E. T. Owen.

In Germanic Languages, of Prof. W. H. Rosenstengel.

In Scandinavian Languages, of Prof. Julius E. Olson.

In English, of Prof. J. C. Freeman.

In Rhetoric, of Prof. D. B. Frankenburger.

In Pure Mathematics, of Prof. C. A. Van Velzer.

In Applied Mathematics, of Prof. C. S. Slichter.

In Astronomy, of Prof. G. C. Comstock.

In Math. Physics, Electricity, and Magnetism, of Prof. J. E. Davies.

In Physics, of Prof. F. W. Snow.

In Chemistry, of Prof. W. W. Daniells.
In Geology, of Prof. C. R. Van Hise.
In Mineralogy and Petrography, of Prof. W. H. Hobbs.
In Zoology, of Prof. E. A. Birge.
In Botany, of Prof. C. R. Barnes.
In Bacteriology, of Prof. H. L. Russell.

For graduate courses in the Colleges of Engineering and Agriculture and the School of Pharmacy, see statements under those headings.

UNDERGRADUATE DEPARTMENT.

There are two general schemes or systems of study by which the bachelor's degree may be reached : the Course System and the Group System (p. 58), the fundamental idea in the one being variety and breadth of culture ; in the other, concentration and thoroughness.

Under both systems there are required for graduation thirty-six terms' work in the regular studies. By a term's work is meant the equivalent of five exercises weekly for one term. A thesis is required as part of the regular work of each student, counting as a two-fifths study for two terms. In addition, there are required of all students :

1. Hygiene, twice weekly, one term, preferably in Freshman year.
2. Military drill, of all able-bodied male students during Freshman and Sophomore years, and gymnastic exercise of young women during Freshman year.
3. Synoptical lectures (p. 59), in such subjects as may be assigned to the student by his class-officer under the rules of the Faculty. At present each member of the Senior and Junior classes is required to elect courses of lectures so that he will have one lecture weekly.

A. THE COURSE SYSTEM.

The University offers, in the College of Letters and Science, six courses of study leading to the bachelor's degree: The Ancient Classical Course, leading to the degree of Bachelor of Arts; the Modern Classical, the English, and the Civic-Historical courses, leading to the degree of Bachelor of Letters; the General Science and Pre-medical courses, leading to the degree of Bachelor of Science. In the Ancient and the Modern Classical courses, languages, ancient and modern, are the central studies. In the General Science and Pre-medical courses, science; in the English Course, the English language and literature, in the Civic-Historical Course, history, economics, and political science are the main lines.

The Pre-medical Course is intended to give a broad and solid foundation for the professional medical course, together with collegiate culture.

The Chicago College of Physicians and Surgeons, Rush Medical College, and the Chicago Medical College have approved the course and will accept it as the equivalent of one year's study, thus enabling those who have taken the four years' course here to complete their medical course in these colleges in three years.

Students desiring a similar course of scientific study introductory to the practice of pharmacy are referred to the account of the Four Years' Course in Pharmacy on a subsequent page.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS.

Ancient Classical Course.

Freshman Year: Greek 4;* Latin 4; mathematics 4; rhetoric 2; Greek and Roman History 2; military drill, gymnastics, hygiene 3.

Sophomore Year: Greek 4; Latin 2; German or French 4; physics 3; rhetoric 2; military drill, gymnastics 3; electives 0-5.

Junior and Senior Years: Philosophy 5, one year; thesis 2, two terms; electives, enough to make thirty-six terms' work besides military drill, gymnastics, hygiene, and such synoptical lectures as may be required.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF LETTERS.

1. Modern Classical Course.

Freshman Year: German 4; Latin 4; mathematics 4; Greek and Roman history 2; rhetoric 2; military drill, gymnastics, and hygiene 3.

Sophomore Year: German 2; Latin 2; French 4; physics 3; rhetoric 2; military drill, gymnastics 3; electives 2–7.

Junior and Senior Years: Philosophy 5, one year; thesis 2, two terms; electives, enough to make thirty-six terms' work besides military drill, gymnastics, hygiene, and synoptical lectures.

*The figures refer to the number of hours required weekly throughout the year.

2. Civic-Historical Course.

Freshman Year: Latin or German 4; mathematics 4; Greek and Roman history 2; English history 3; rhetoric 2; military drill, gymnastics, and hygiene 3.

Sophomore Year: German 4; French 4; science (physics, biology or chemistry) 5; rhetoric 2; military drill, gymnastics 3; electives 0–5.

Junior and Senior Years: Philosophy 5, one year; Latin, German, French, or Norse, one year (the German must be taken if begun in Sophomore year); thesis 2, two terms. The remaining studies, sufficient to make thirty-six terms' work, are elective, except that the equivalent of twelve hours per week for one year must be elected in history, economics, and political science. Military drill, gymnastics, hygiene, and synoptical lectures are not included in the thirty-six terms' work.

3. English Course.

Freshman Year: German 4; English history 3; Greek and Roman history 2; mathematics 4; rhetoric 2; military drill, gymnastics, and hygiene 3.

Sophomore Year: German 4; English literature 3; physics 4, or biology 5, or chemistry 5; Anglo-Saxon 3, or Norse 4, or French 4; rhetoric 2; military drill, gymnastics 3; electives 0–3.

Junior and Senior Years: Philosophy 5, one year; English language and literature 5, two years. (This must include the course in Anglo-Saxon and middle English, which may be taken in the Sophomore year.) Study of a language other than English and German 4 or 5, one year; thesis 2, two terms; electives, enough to make thirty-six terms' work besides military drill, hygiene, and such synoptical lectures as may be required.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE.

1. General Science Course.

Freshman Year: Biology 5; German 4; mathematics 4; rhetoric 2; military drill, gymnastics, hygiene 3.

Sophomore Year: French 4; chemistry or mathematics 5 (if mathematics is chosen, chemistry must be taken in Junior year); physics 4 or 5; rhetoric 2; military drill, gymnastics 3; electives 0–5.

Junior and Senior Years: History, philosophy, political science, or economics 5, one year; advanced French or German 4 or 5, one year; advanced science 5, two years; thesis 2, two terms; elective studies enough to make thirty-six terms' work, besides military drill, hygiene, and such synoptical lectures as may be required.

2. Pre-Medical Course.

The required studies of the four-years' Pre-medical Course, leading to the degree of bachelor of science, are the same as those of the General Science Course. The students in the Pre-medical Course are required to turn their scientific work and their elections in the direction of those sciences which are preliminary to the study of medicine.

3. Engineering and Agricultural Courses, and Four-years' Pharmacy Course.

For details of these courses, look under College of Engineering, College of Agriculture, and School of Pharmacy, on later pages.

SPECIAL COURSES FOR NORMAL GRADUATES.

To these courses the regular graduates from the advanced courses of the State normal schools of Wisconsin will be admitted with the rank of juniors. Two years of successful study will enable the graduates to complete one of the courses, and by proper selection of studies, to graduate with the degree of Bachelor of Letters or of Bachelor of Science. Two years of residence at the University are required of candidates for a degree.

Normal graduates who may have a sufficient knowledge of Latin, French, or German, in addition to the full acquirements of normal school graduates, may take such studies as will be the nearest available equivalents of those of the Modern Classical Course.

English Course for Normal Graduates.

JUNIOR YEAR.

I. Language (Latin, French, or German), 4 hours throughout the year.

II. History, 3 hours throughout the year.

III. English literature, Course 5, 3 hours throughout the year. Students who have had a course in English literature may substitute the course in Anglo-Saxon and Middle English.

IV. (a) Science (chemistry, physics, mathematics, astronomy, mineralogy, or biology), 5 hours throughout the year, or (b) Philosophy, 5 hours throughout the year.

SENIOR YEAR.

I. Language (Latin, French, or German), 4 hours throughout the year.

II. (a) Economics, Course 1, 3 hours, fall term. (b) Additional work in economics or political science, 3 hours, two terms.

III. (a) English literature, 3 hours throughout the year, or (b) History, 3 hours throughout the year.

IV. Electives, sufficient to make, with required work, at least 15 hours throughout the year.

Science Course for Normal Graduates.

JUNIOR YEAR.

I. SCIENCE. (1) A continuous course in chemistry, physics, mathematics, or astronomy throughout the year; and (2) A continuous course in botany, zoology, or mineralogy throughout the year. Mineralogy may be taken, preparatory to geology in the Senior year. One of these courses in science may be taken in the Senior year, but if geology is elected, courses in chemistry, mineralogy or physics, or in zoology or botany, should be taken during the Junior year.

II. LANGUAGE (Latin, German, or French) pursued throughout the year. Students who chose English literature in the normal course will be required to take two courses in language throughout the year.

III. ELECTIVES. If either course in science is deferred until the Senior year, elective studies are to be substituted. Extra electives may also be taken by those prepared for them.

SENIOR YEAR.

I. SCIENCE, a continuous study running through the year. If geology is chosen as one of the three required courses, it should be taken during this year, and be preceded by the two other courses in science.

II. LANGUAGE (Latin, German, or French) throughout the year. Students who chose English literature in the normal course will be required to take two courses in language throughout the year.

III. ELECTIVES. Sufficient to make at least three full studies.

ELEMENTARY GREEK COURSE.

GREEK, Goodwin's Grammar, Composition, and Homer's Iliad.

GREEK, Xenophon's Anabasis, Elements of Language.

LATIN, Cicero's Select Orations, Latin Composition, Virgil.

This course is preparatory to the Ancient Classical Course. See p. 44.

B. THE GROUP SYSTEM.

The object of the Group System is to give continuity, concentration, and thoroughness to the leading lines of study and at the same time to afford a wide (though of necessity only general) familiarity with the broad field of knowledge. The work of the four years is divided into two parts, the first consisting of a group of basal studies intended to furnish a solid foundation for the second part, which consists of (1) a leading line of study running through two years, constituting the major study of the student; (2) a series of assigned studies supplementary to it, selected by the professor in charge of the leading line; and (3) a series of elective studies sufficient to make up a full course. The basal group of studies will occupy the Freshman and Sophomore years and may in some instances extend into the Junior year. The work of the second part, the university group, will occupy the Junior and Senior years. These courses will be supplemented by synoptical lectures in the leading lines of study not otherwise taken, so that the student will possess some knowledge of their salient features.

THE BASAL GROUP.

Freshman and Sophomore Years.

This group must embrace at least three full studies during each of the first two years of the course, which must include the following:

1. A year's course (four hours weekly) in mathematics.
2. A year's course in physical or natural science with laboratory work.
3. A course in rhetoric, twice a week for two years.
4. Language study, sufficient, in addition to previous work, to give a reading knowledge of two languages besides English. If this is not accomplished by the close of the Sophomore year, language study must be continued.

Among the basal studies there should be at least one course running through a year especially preparatory to the major study contemplated in the last two years of the course.

UNIVERSITY GROUPS.

Junior and Senior Years.

This groups the work of the last two years of the course, and must include at least the following:

1. *A Major Study* running consecutively through two years, constituting the leading study of the student. Extra work beyond the

usual requirements of a full study will be expected, the precise amount and form of which will be determined by the professor in charge.

2. *An Assigned Minor Study*, to be named by the professor in charge of the major study, which it is intended to supplement. This will be equivalent to one full course for two years, and may be a single continuous study or a succession of courses selected from different groups.

3. *An Elective Minor Study.* This may be made up of a series of courses or of a single continuous study, and must be at least equivalent to a full study throughout the last two years of the course

4. *Synoptical Lectures* will be required as ordered by the Faculty.

The major studies are to be selected from the following groups:

1. Psychology, Ethics, Æsthetics, Logic, Pedagogy (Philosophical group).
2. Economics, Political Science (Civic group).
3. History (Historical group).
4. English Language and Literature, Anglo-Saxon, Rhetoric (English group).
5. French, Italian, Spanish (Romance group).
6. German, Norse, Anglo-Saxon (Germanic group).
7. Greek, Latin, Hebrew (Classic group).
8. Mathematics, Astronomy, Physics (Mathematical group).
9. Botany, Zoology (Biology group).
10. Chemistry, Physics (Chemico-physical group).
11. Mineralogy, Petrography, Geology (Geology group).

SYNOPTICAL LECTURES.

The purpose of the synoptical lectures is to present the outlines of the leading branches taught in the University in such a way as to convey the maximum of important information in the minimum of time, so that the students may become familiar with the salient features of subjects which they are unable to take up as regular studies. The aim is to broaden the student's information and interest and correct the effects of too great specialization.

These courses of lectures will be serviceable to students in selecting their leading lines of studies, by enabling them to become familiar with the chief features of the several subjects they may under consideration before making their choice.

These lectures will be accompanied by class work, and will be closed by an examination.

The lectures and accompanying class exercises will be given between 4 and 6 P. M., five days in the week: The subjects for 1893–94 are as follows:

In modern languages, on German, French and Norse; in the mathematical group, lectures on pure and applied mathematics and astronomy; in the chemico-physical group, on chemistry and physics; in the philosophical course, lectures on psychology, philosophy, ethics, and æsthetics; in the geological group, courses on mineralogy, petrography, palaeontology, and geology.

The following courses will be given during 1894–95: In biology, in history; in economics and political science; in the classical languages; and in English literature.

GENERAL INFORMATION.

LITERARY AND SCIENTIFIC SOCIETIES.

The literary societies, the Athenæan, Hesperian, Philomathian, and Phœnix, composed of gentlemen, and the Castalian and Laurean, composed of ladies, are sustained with unusual interest and constitute an important means of intellectual training. A German society, the Bildungsverein, and a Scandinavian society, the Nora Samlag, cultivate an interest in the German and Norse languages and literature. There are also journal clubs in the departments of biology, mathematics, and chemistry.

LADIES' HALL.

Lady students are allowed the same choice of boarding accommodations that is accorded to gentlemen, but to provide for those who prefer a home under the immediate auspices of the University, a Ladies' Hall is maintained. It contains suits of rooms for sixty-two students, and ample accommodations for boarding. The apartments are in suits of two and three rooms, each suit accommodating four students. There is a bath room on each floor. The building is heated by steam, lighted by gas, and has three fire-escapes. Students' rooms are carpeted and furnished, but occupants are expected to provide washstand furniture, towels, napkins, napkin rings, sheets, pillow-cases, counterpanes, and blankets. Young women occupying this building are under the immediate charge of the preceptress, and are required to board in the Hall. They are expected cheerfully to conform with the requirements necessary for a family of students. Students are admitted only on the expectation of remaining throughout the term, and the charges for board are by the term and not for any fraction of it. No deduction is made for voluntary absence, and any commutation in cases where students leave before the close of the term, except in cases of necessity, is entirely voluntary with the matron in charge. To secure rooms in advance, payment of room-rent for the ensuing term ($6.00) must be made to the Secretary of the Board. The music department has accommodations in this

building, with music rooms for piano practice, and a hall for the use of the general music classes, gymnastics, and the ladies' literary societies.

No responsibility is assumed for lady students rooming in the city beyond that involved in good scholarship and general deportment.

The foregoing statements and the prices of board given below under the head of "Charges and Fees" relate to the current year and are subject to modification for the ensuing year. The price of board will be no greater than that stated.

ROOMS AND BOARD.

Rooms furnished and unfurnished can be obtained in the city at reasonable rates. The cost of board in clubs is from $2.00 to $2.50 per week; in private families from $2.50 to $4.00 per week. Washing costs from sixty to seventy-five cents per dozen. Many of the students support themselves in whole or in part. The places offering available work are eagerly sought for and cannot always be obtained at once. Those dependent on themselves should secure some means before coming here, and be ready to wait and learn how to help themselves.

CHARGES AND FEES.

Tuition for residents of the State of Wisconsin, . . .	FREE.
Tuition for non-resident students, per term, ...	$6 00
General Expenses—First term, ...	5 00
General Expenses — Second term, ...	5 00
General Expenses — Third term, ...	2 00
Room-rent in Ladies' Hall, per term, ...	6 00
Fuel and light in Ladies' Hall at actual cost (about $20 a year).	
Board in Ladies' Hall — Fall term, ...	50 75
Board in Ladies' Hall — Winter term, ...	42 00
Board in Ladies' Hall — Spring term, ...	36 75
Washing, Ladies' Hall, per dozen, ...	60
Instrumental Music, 20 lessons, ...	10 00
Use of instrument for practice, 10 weeks, ...	2 00–5 00
Vocal Music, 20 lessons, ...	10 00

Students will be charged for not less than one term, and no deduction will be made for voluntary absence. Payment of all University charges for tuition, room-rent, heating, etc., is required

strictly in advance, and made to the Secretary of the Board of Regents.

Students working in the laboratories are required to pay a fee to cover the cost of the materials and instruments used by them. When this cannot be fixed beforehand, a deposit sufficient to cover the probable cost is required and an account of the same is kept, and the amount of the deposit not used is returned to the student at the close of his term of study in the laboratory.

The items of expense are subject to revision at the commence ment of each collegiate year.

DEPARTMENTS OF INSTRUCTION.

PHILOSOPHY.

PROFESSOR STEARNS, PROFESSOR JASTROW, AND DR. SHARP.

1. General Psychology. James' Outlines of Psychology, lectures, and readings. *Fall term; M., Tu., W., Th., F., in three divisions, at* 8, 9, *and* 2. Professor JASTROW and Dr. SHARP.

2. Experimental Psychology. (a) Lectures and demonstrations covering in a fairly comprehensive and practical manner the field of experimental psychology. *Winter term, M., W., F., at* 9. (b) Laboratory work in psychology; Sanford's Course in Physiological Psychology. *Winter term; four hours weekly.* Professor JASTROW.

3. Advanced Experimental Psychology. Special themes are experimentally treated and the literature consulted under personal supervision. *Throughout the year; three times weekly.* Professor JASTROW.

4. Comparative Psychology. Lectures covering the more important topics in animal psychology and the development of the child. *Fall term; M., W., F., at* 10. Professor JASTROW.

5. Abnormal Psychology. Lectures upon illusions, dreams, hypnotism, insanity, idiocy, deaf-mutism, blindness, diseases of speech, of will, of the emotions, psychic epidemics, and allied topics. *Winter term; Tu., W., Th., at* 4. Professor JASTROW.

6. Anthropological Psychology. Lectures covering from a psychological point of view the topics treated in Tylor's Anthropology. *Spring term; Tu., Th., at* 10. Professor JASTROW.

7. History of Philosophy. (a) History of Greek Philosophy; Zeller's Outlines of Greek Philosophy, and Windelband's History of Philosophy. *Winter term; M., W., F., at* 9. (b) The Idealistic Philosophy; Falckenberg's History of

Modern Philosophy. *Winter and spring terms; Tu., Th., at* 9. (c) History of English Philosophy, from Locke to Herbert Spencer. *Spring term; M., W., F., at* 9. Professor STEARNS.

8. The Philosophy of Lotze. Metaphysics and the Philosophy of Religion. *Fall and winter terms; twice a week, hours and days on consultation.* Professor STEARNS.

9. The Philosophy of Modern Science. Discussion of some of the problems in the philosophy of nature. *Spring term; three times a week, hours and days on consultation.* Professor STEARNS.

10. The Theory of Cognition. *Fall term:* Descartes, Locke, Berkeley, Hume. *Winter term;* Kant's Critique of Pure Reason. *Spring term:* T. H. Green's Critique of Hume; Modern English and German Theories. *Throughout the year; three times a week.* Dr. SHARP.

11. Reading in German Philosophy. Ihering's Zweck im Recht. *Winter and spring terms; three times a week.* Dr. SHARP.

12. Philosophical Seminary. *Winter and spring terms; Tuesday evenings.* Required of Group students in Philosophy. Professor STEARNS, Professor JASTROW, and Dr. SHARP.

13. Systematic Ethics. The greater part of the time is devoted to a study of Martineau's views as presented in his Types of Ethical Theory. This study of a representative intuitional theory will be supplemented by a course of lectures. *Winter term. M., Tu., W., Th., F., at* 12. Dr. SHARP.

14. Ethical Seminary. A study of the leading forms of modern ethical theory. Lectures, essays, and discussions. *Spring term; twice a week.* Dr. SHARP.

15. Æsthetics and History of Art. The philosophy of art and an elementary outline of the history of art, and some of the principles of art criticism. *Winter term; M., Tu., W., Th., F., at* 11. Professor STEARNS.

16. Elementary Logic. To a certain extent Fowler's Logic Deductive and Inductive, is used as a text book, but is considerably supplemented by lectures and discussions introducing the more recent modes of treating the problems of logic. *Winter term; M., Tu., W., Th., F., at* 2. Professor JASTROW.

17. Advanced Logic. Lectures upon the nature of deductive and inductive reasoning; the history of logic; the principles of science; fallacies, etc. *Spring term; Tu., Th., at* 9. Professor JASTROW.

18. Synoptical Lectures. *Fall term;* Æsthetics, Professor STEARNS; *winter term;* Thinking, Professor JASTROW; *spring term;* History of Modern Ethics, Dr. SHARP.

In the fall term are given courses 1, 3, 4, 8, 10, 15; in the winter term, 2, 3, 5, 7, 8, 10, 11, 12, 13, 16; in the spring term, 3, 6, 7, 9, 11, 12, 14, 17.

PEDAGOGY.

PROFESSOR STEARNS AND MR. JACOBS.

1. History of Educational Theories and Institutions, Greek, Roman and Modern; lectures, readings, and essays. *Fall term; M., Tu., W., Th., F., at* 10.

2. School Supervision. The making and administration of courses of study, examinations, promotions, inspections, etc. *Fall term; Th. and F., at* 8.

3. The Philosophy of Education. Lectures, readings, and discussions on the nature, forms, and elements of education. *Winter term; M., W., F., at* 10.

4. The Herbartian Pedagogy. Herbart's Science of Education; Rein's Pedagogics; Lange's Apperception. *Winter term; twice a week; hours and days on consultation.*

5. School Law and Hygiene. *Winter term; Tu., Th., at* 10.

6. Methods and Management in Grammar and High School Grades. *Spring term; M., W., F., at* 10.

7. Problems in Applied Psychology. The training of faculty, child study, mental and bodily defects, etc. *Spring term; three times a week.*

8. Pedagogical Seminary. *Spring term; Tu., Th., at* 10.

ECONOMICS.

PROFESSOR ELY, ASSOCIATE PROFESSOR SCOTT, MR. SWAIN, MR. HUBBARD.

1. The Principles of Political Economy. Emphasis will be laid upon the sociological character of the science and upon the importance of the subjective standpoint in the explanation of economic phenomena. Ely's Outlines of Economics. *Fall term; M., Tu., Wed., at* 8 *and* 9. Associate Professor SCOTT and Mr. SWAIN.

2. The Classical Economists. Adam Smith, Ricardo, Mill and Cairnes. Study of characteristic parts of the works of these authors with lectures and class discussions. *Winter term; M., Tu., Wed., at* 9. Associate Professor SCOTT.

3. Money and Banking. Especial attention will be given to the history of bi-metallism in this country and Europe, to the various banking systems of the world, and to our own monetary and banking problems.—Walker's Money, Trade and Industry, Laughlin's History of Bi-metallism in the United States, and Dunbar's The History and Theory of Banking. *Spring term; M., Tu., Wed., at* 8 *and* 9. Associate Professor SCOTT.

4. Practical Economic Questions. Socialism, communism, co-operation, profit sharing, labor organizations, factory legislation, and similar topics. *Winter term; M., Tu., Wed., at* 8 *and* 9. Mr. SWAIN and Mr. HUBBARD.

5. The Financial history of the United States. The financial legislation and experience of the United States, including the finances of the Colonies and the Revolutionary epoch. *Spring term; M., Tu., Wed., at* 8. Mr. HUBBARD.

6. Distribution of Wealth. Plans which have been advocated for bringing about a better distribution of wealth will be discussed. *Throughout the year; M., Tu., at* 3. Professor ELY.

*7. History of Economic Thought. The history of economic theories in classical antiquity; their development under the influence of the Christian era and the middle ages to the time of the Mercantilists; the rise and growth of economics as a distinct branch of social science. Existing schools of economic thought. *Winter term; M., Tu., Wed., at* 4. Professor ELY.

* Will not be given in 1894–95.

*8. Theories of Value and Interest. History of value and interest theories down to the present day. The seminary method of instruction will be employed, and each student will be expected to study critically the writings of the theorists examined. *Throughout the year; M., Tu., at* 12. Associate Professor SCOTT.

9. Theories of Rent, Wages, and Profits. A critical study of the history of these theories conducted in the manner described in the previous course. *Throughout the year; Wed., Th., at* 12. Associate Professor SCOTT.

10. Theories of Production and Consumption. Theories of social prosperity as seen in the writings of economists on the subjects of production and consumption. Theories of population and of capital, and theories which concern the operation of physical forces and the influence of the consumption of wealth on production and distribution. Especial attention will be given to the writings of Professor Simon N. Patten on these subjects. *Fall and winter terms; M., Tu., at* 12. Associate Professor SCOTT.

11. The Theories and Statistics of Monetary Problems. A course for advanced students on monetary theories and the statistics of price in relation thereto. Open to students who have had an elementary course in political economy and Course 3 or its equivalent. *Spring term; M., Tu., at* 12. Associate Professor SCOTT.

12. Public Finance. A discussion of the revenues and expenditures of government with a sketch of their historical development. *Fall term; M., Tu., W., at* 4. Professor ELY.

13. American Taxation. A brief examination of federal taxation and a more detailed study of taxation in American states and cities. *Winter term; M., Tu., W., at* 4. Professor ELY.

14. The Finances of the Ancient Greeks. History of the financial system of the ancient Greeks and a study of their financial problems. *Winter term; Tu., Th., at* 11. Professor VAN CLEEF.

15. Social Ethics. This course deals with the ethics of economic institutions and relations. *Spring term; M., Tu., W., at* 4. Professor ELY.

*16. Socialism. Historical account of its origin, followed by a critical examination of its nature, strength, and weakness. *Fall term; three times per week.* Professor ELY.

17. Readings in German Economics and Social Philosophy. The object of this course is to assist students in learning to read German writers readily and to familiarize them with some of the more important recent scientific works. At present the class is reading Professor R. von Ihering's Zweck im Recht. *Winter term; three times a week.* Dr. SHARP.

18. Business Corporations. The nature and economic functions of corporations, including a sketch of their origin and history. Lectures. *Fall term*; *Th. at* 4. Mr. HUBBARD.

19. The Economics of Agriculture. A discussion of those economic topics which are of especial interest and importance to farmers. This course is designed primarily for the students of the College of Agriculture, though any student who desires may be admitted. Lectures. *Two hours per week during the winter term.* Associate Professor SCOTT.

20. Economic Seminary. This is designed primarily for advanced students who wish to carry on special investigations under the guidance which the department affords. Each student, with the consent of the instructors, may select a topic for investigation for himself, or one may be assigned him connected with the subject selected for the main seminary work of the year. The subject for the present year is American Taxation. For 1894–95 the subject will be Transportation. A subordinate feature of the seminary work is the review of recent books and important articles published in the periodicals. *Wednesday evenings; throughout the year from* 8 *to* 10. Professor ELY and Associate Professor SCOTT.

[21. Synoptical Lectures. A series of weekly synoptical lectures on Economics will be given during part of the year 1894–95.]

POLITICAL SCIENCE.

PROFESSOR PARKINSON.

1. Elementary Law. A general view of the whole field of law, with its terminology and leading principles. *Throughout the year; Tu., Th., at* 10.

2. Constitutional Law (English). A brief study of the English constitution from the time of Magna Charta to the present — especially of its conventional development since the Revolution of 1688. Growth of constitutional law in the United States prior to the adoption of the present constitution. *Fall term; Tu., Th., at* 9.

3. Constitutional Law (American). The constitution of the United States. This is designed to follow Course 2, inasmuch as some knowledge of the English constitution is of great help to intelligent examination of our own. *Winter and spring terms; Tu., Th., at* 9.

4. Constitutional Law (American). A continuation of Course 3. A closer study will here be made of the more important parts of the constitution of the United States, especially of the amendments — of their nature, scope, and influence as a bill of rights. An examination of leading cases will be made prominent. *Fall and winter terms; M., W., Fr., at* 9.

5. Constitutional Law (Comparative). Comparison of the constitutions of leading states, and of the salient features of their government and administration. Lectures, papers and discussions. *Spring term; M., W., Fr., at* 9.

6. Roman Law. This course aims to trace the more important steps in the development of the Roman Law, but gives chief attention to its later form, as codified by Justinian. *Fall term; M., W., Fr., at* 10.

7. International Law. An outline of the rules controlling international affairs and of the modifications and advances made, from time to time, in the recognized law of nations. Lectures, papers and discussions, with collateral reading. *Winter and spring terms; M., W., Fr., at* 10.

[8. Synoptical Lectures. A course of lectures in Political Science will be given once a week during part of the year 1894-95.]

HISTORY.

PROFESSOR TURNER, PROFESSOR HASKINS, ASSISTANT PROFESSOR COFFIN, AND MR. LIBBY.

1. Ancient History. A brief outline of Oriental history, and a more particular study of the history of Greece and Rome. *Throughout the year; Tu., Th., in two divisions, at* 9 *and* 10. Professor HASKINS and Mr. LIBBY.

   Required of Freshmen in the Ancient Classical, Modern Classical, Civic-Historical, and English courses.

2. English History. Political and social history of England from the earliest period to the present time. Text book, lectures, and topical reports. *Throughout the year; M., W., F., in two divisions, at* 9 *and* 10. Assistant Professor COFFIN.

   Required of Freshmen in the Civic-Historical and English courses.

3. History of the Middle Ages. Political and social history of continental Europe from the barbarian invasions to the Renaissance. *Throughout the year; M., W., at* 11. Professor HASKINS.

   Recommended to Sophomores and Juniors; should precede Courses 5, 6, and 10.

4. American History. General survey from the discovery of America to the present time, with emphasis upon political history. *Throughout the year; Tu. Th., at* 11. Professor TURNER.

5. Modern European History. Beginning with the Renaissance and extending to the French Revolution, with a brief survey of the history of the Revolution and the nineteenth century. Text-book, coöperative topical work, and lectures. *Throughout the year; M, W., F., at* 11. Given in 1893-94. Omitted in 1894-95. Assistant Professor COFFIN.

   Courses 1, 2, 3, 4 and 5 furnish a general historical view as a preparation for special study in the lines of the history of institutions, modern European history, and the history of the United States..

[6. History of the Nineteenth Century. This course covers the period from 1789 to the present time, and is designed to enable the student to understand current events by show-

ing their connection with recent history. Lectures, collateral reading, and topical work *Throughout the year; M., W., F., at* 11. Given in 1894–95. Omitted in 1893–94. Assistant Professor COFFIN.]

7. Economic and Social History of the United States. Particular attention will be paid to the advance of settlement across the continent, and to the economic and social results of this movement. The course should be preceded by Course 4 or its equivalent. *Throughout the year; M., W., Th., at* 12. Professor TURNER.

8. Constitutional History of England. An advanced course designed for Juniors and Seniors who have had course 2 or its equivalent. *Throughout the year; Tu., F., at* 12. Professor HASKINS.

[9. History of Institutions. Selected topics in the early history of institutions; the political institutions and ideas of the Greeks and Romans. *Throughout the year; Tu., Th., at* 11. A third hour will be devoted to the sources and literature of Greek and Roman history. Open to graduate students and Seniors of suitable preparation. Given in alternate years, beginning with 1894–95. Professor HASKINS.]

10. History of Institutions. The political institutions of the later Roman empire, of the early Germans, and of the Franks; the development of the feudal system; and the constitutional history of France to the close of the seventeenth century. *Throughout the year; M., W., F., at* 11. Open to graduate students and Seniors of suitable preparation. Given in alternate years, beginning with 1893–94. Professor HASKINS.

[11. Constitutional and Political History of the United States From the beginning of the colonial period to the close of the war of 1812. The subject is studied from the sources by the seminary method, combined with lectures and required reading in secondary authorities. *Throughout the year; M., W., Th., at* 2:15. Open to graduate students and Seniors of suitable preparation. Given in alternate years; omitted in 1893–94. Professor TURNER.]

12. Constitutional and Political History of the United States. From the close of the War of 1812 to the close of the Re-

construction era. *Throughout the year; M., W., Th., at* 2:15. Professor TURNER.

Open to graduate students and Seniors of suitable preparation. Given in alternate years; omitted in 1894–95.

13. Advanced Modern European History. Open only to those who have had Course 5 or its equivalent. Designed for more minute work on important epochs, and conducted mainly by coöperative topical work, with lectures and collateral reading bearing especially on the development of diplomacy. *Throughout the year; ranking as a three fifths study.* Assistant Professor COFFIN.

14. Historical Seminary. This is designed to afford training in original research. The seminary meets in two divisions:

(a) Graduate Seminary. For conference, consideration of papers, and criticism of current historical literature. *Fortnightly throughout the year, Th., 4 to 6*

(b) Senior Seminary. Open to those who take their Senior thesis in history. *Fortnightly throughout the year, Th., 4 to 6.*, dividing at times into separate seminaries under the various instructors.

[15. Synoptical lectures will be given weekly through the year 1894-95. In the fall term by Professor Haskins, in the winter term by Assistant Professor Coffin, and in the spring term by Professor Turner.]

GREEK.

PROFESSOR KERR AND PROFESSOR VAN CLEEF.

1. Grammar, Prose Composition, Homer. Goodwin's Greek Grammar (Revised Edition of 1893), translation of the English sentences in White's Beginner's Greek Book into Greek, and three books of Homer's Iliad. *Throughout the year; M., W., F., at* 12. Professor KERR.

2. Elements of the Language, Xenophon's Anabasis, Translation at sight. White's Beginner's Greek Book. Four books of Xenophon's Anabasis or its equivalent. *Throughout the year; Tu., Th., Sat., at* 12. Professor VAN CLEEF.

Courses 1 and 2 taken together comply with the entrance requirements in Greek to the Ancient Classical Course. They may, however, be taken independently, in which

case 2 is adapted especially for beginners, while 1 may be pursued by those who have already become familiar with the elementary principles of the language and have read the required amount of the Anabasis.

3. Lysias, Plato. Five orations of Lysias, Plato's Apology and Crito. *Throughout the year; M., Th., at* 10. Professor KERR.

4. Grammar, Composition, and Homer's Odyssey. A thorough review of the grammar, accompanied by written translations from English into Greek, and five books of Homer's Odyssey. *Throughout the year; Tu., F., at 10.* Professor VAN CLEEF.

5. Herodotus, Lyric Poets. Book VII. of Herodotus, both in prepared lessons and at sight, selections from the lyric poets, lectures on the geography, mythology, and monuments of Greece. *Throughout the year; Tu., F., at* 10. Professor KERR.

6. Demosthenes' Olynthiacs and Philippics, Sophocles' Oedipus Tyrannus. The translation will be accompanied by lectures on the history of oratory and the drama. *Throughout the year; M., Th., at* 10. Professor VAN CLEEF.

7. Plato's Dialogues. Plato's Phædo and Republic. Lectures on Plato. *Throughout the year; M., W., F., at* 11. Professor KERR.

8. Greek Dramatic Poets. Alcestis of Euripides, Prometheus of Aeschylus, Iphigenia among the Taurians of Euripides, and Philoctetes of Sophocles (omitted in 1894–95; given in 1895–96). *Throughout the year; M., W., F., at* 11. Professor KERR.

9. Private Antiquities. The Life of the Ancient Athenians. Lectures illustrated by lantern views. *Throughout the year, Tu., Th., at* 11. Professor VAN CLEEF.

10. Legal Antiquities. Lectures on the public life of the Greek citizen and the public economy of the state. (*a*) Political life of the Athenian; (*b*) Greek Finances. (*c*) Political economy of Athens. *Throughout the year; Tu., Th., at* 11. (Omitted in 1894–95.) Professor VAN CLEEF.

11. Seminary in the Modern Greek Language and Literature. A study of the changes in form and structure which the language has undergone since the classical period. Readings from contemporary Greek authors and a comparison of their writings with the prose and poetry of the Attic Greek. Papers and discussions upon topics connected with the course of reading. *Throughout the year*; *Tu.*, 2:30–4. Professor KERR.

12. Greek Seminary. Reading and interpretation of several dialogues of Plato, preparatory to the text criticism of the Symposium. This course is intended primarily for graduates, but is open to all who have completed the required Greek of the Ancient Classical Course. The work will be accompanied by papers on special topics. *Throughout the year*; *T.*, 2:30–4. Professor VAN CLEEF.

Courses 1 and 2 are open to all students. Courses 3 and 4 are required of Ancient Classical Freshmen; Courses 5 and 6 of Ancient Classical Sophomores. All courses are open to those properly qualified to undertake the work.

LATIN.

PROFESSOR HENDRICKSON, MR. SOBER, AND MISS ALLEN.

1. Cicero, Virgil. Cicero's Orations (three), Virgil's Aeneid (six books), Latin Grammar and Composition. Required of Greek class. *Throughout the year; M., Tu., W., Th., F., at* 8. Miss ALLEN.

2. Cicero, Livy, Horace. Cicero de Senectute, Livy (two books), Selected Odes of Horace, Latin Composition, and Roman Literature. Private readings. Required of Freshmen of Ancient Classical and Modern Classical courses. *Throughout the year*; *M., Tu., Th., F.* Two divisions, M. Cl. *at* 10, An. Cl. and Civ.-Hist. *at* 11. Mr. SOBER.

3. Cicero, Horace, Tacitus. Selected Letters of Cicero, Selected Satires and Epistles of Horace, the Agricola of Tacitus. Required of Sophomores of Ancient Classical and Modern Classical courses. *Throughout the year; Tu., Th., at* 9. Professor HENDRICKSON.

4. Nepos, Cicero, Terence, Ovid. The aim of this course is to give facility in reading, and large amounts of various authors will be read rapidly. Elective for Sophomores. *Throughout the year; M., W., F., at* 9. Mr. SOBER.

5. (a) Lucretius (with selections from the philosophical works of Cicero); (b) Tacitus (portions of the Annals); (c) Catullus. *Throughout the year; M., W., F., at* 10. Professor HENDRICKSON.

[6. (a) Plautus (Trinummus) Terence (Andria); (b) Cicero (de Orator.; (c) Juvenal, Martial (Selections). *Throughout the year; M , W., F., at* 10. Professor HENDRICKSON.]

Courses 5 and 6 are given in alternate years, Course 6 in 1894–95.

7. History of Roman Literature. Lectures accompanied by readings in Latin and in English. *Throughout the year; Tu , Th., at* 12. Professor HENDRICKSON.

[8. Latin Grammar. (a) Sounds and Forms, (b) Syntax, (c) Syntax. *Throughout the year; Tu , Th., at* 12. Professor HENDRICKSON.]

Courses 7 and 8 are intended especially for students expecting to teach or to pursue graduate studies in Latin and are given in alternate years. (1893–94, Course 7; 1894–95, Course 8.)

9. Latin Seminary. Critical study and interpretation (a) of the Dialogus and the Agricola of Tacitus; (b) of the literary epistles (Book II.) of Horace. One meeting of an hour and a half counting as a two-fifths course. The seminary is intended chiefly for graduate students, but will be open to others of suitable preparation with the consent of the director. Professor HENDRICKSON.

10. Teachers' Course. Hints on the teaching of Latin in preparatory schools. One exercise a week during the spring term. Professor HENDRICKSON.

In 1894–95 this course will not be given separately as heretofore, but will be combined with Course 8.

11. Roman Archaeology and Private Life. Two lectures a week throughout the year; illustrated with lantern slides. *Tu. Th.* Professor HENDRICKSON and Mr. SOBER.

A knowledge of Latin is not required for this course.

[12. Synoptical Lectures. A course of weekly synoptical lectures will be given through part of the year 1894–95.]

HEBREW AND HELLENISTIC GREEK.

PROFESSOR WILLIAMS.

1. Genesis and the general principles of the Hebrew language. *Throughout the year; three times a week.*

2. Historical Hebrew. Samuel and Kings. Grammatical review and textual criticism. *Throughout the year; three times a week.*

3. Hebrew Seminary. Isaiah will form the center of the work for 1894–5. *Throughout the year; one meeting each week.*

   It is hoped that clubs for the study of Isaiah may be formed in the cities and towns of the state, and that this popular work may receive direction and help from the work of the Seminary.

4. Writers of the Assyrian Period. Hebrew syntax. Courses 5 and 6 are intended to give the student a critical view of the literature of this important period of Israelitish history. *Throughout the year; two hours a week.*

5. Hebrew in English. Lectures on the history and literature of Israel. For all students whether they have studied English or not. Not given in 1893–94. *Throughout the year; twice a week.*

6. The Fourth Gospel and the general principles of Hellenistic Greek. For students who have not studied classical Greek. *Throughout the year; three times a week.*

7. Matthew–John. Historical study. Textual criticism. Advanced grammar. *Throughout the year; three times a week.*

   During the year 1892–3 there were conferred upon students of this department one fellowship of $400, three scholarships of $150 each, four of $50 each, and two of $25 each. It is confidently expected that a considerably larger scholarship fund may be secured for the year 1894–95.

   Award of scholarships will be made only for exceptional proficiency in Hebrew or Hellenistic Greek.

SCANDINAVIAN LANGUAGES.

PROFESSOR OLSON.

This department offers instruction in all of the Scandinavian languages (Norwegian, Danish, Swedish, and Old Norse) From one year's instruction in Modern Norse the student is expected to be able to read both Norwegian and Danish authors, as Norway and Denmark have practically the same literary language. Courses 1 and 2 are devoted principally to Norwegian authors, but additional instruction in Danish and Swedish literature is offered to students desiring to pursue these branches beyond the limits of the prescribed courses.

1. Modern Norse, Elementary. First term, Grammar and Reader, and selections from Norse folk-lore stories. Second term, Björnson's En glad Gut, and selections from his shorter stories. Third term, Ibsen's Et Dukkehjem and Terje Vigen, and selections from Jonas Lie's stories. *Throughout the year; M., T., Th., F., at* 12.

2. Modern Norse. First term, Kielland's Skipper Worse, and selections from Norwegian and Danish poetry. Second term, Ibsen's Brand and selections from Swedish poetry. Third term, Lie's Den Fremsynte and Tegner's Frithiof's Saga (in Swedish). *Throughout the year; M., T., W., Th., F., at* 11.

3. History of Scandinavian Literature. Seip and Broch's Litteraturhistorie, with exercises in composition and the study of Hofgaard's Grammatik and Aars's Retskrivningsregler. *Throughout the year; M., W., F., at* 10.

4. Old Norse or Icelandic. Vigfusson & Powell's Reader, with lectures on early Scandinavian history, literature, and mythology. *Throughout the year; T., Th., at* 10.

5. Synoptical Lectures. A course of weekly synoptical lectures will be given during part of the year 1893–4.

All courses are elective. Any of the courses for which the student is prepared may constitute minor studies under the Group system. Those who make the Scandinavian languages their major line should take all of the courses.

The Scandinavian department of the University library affords excellent advantages to students pursuing these studies.

GERMAN.

PROFESSOR ROSENSTENGEL, ASSISTANT PROFESSOR WILKENS, MISS STERLING, MISS REMINGTON, AND MISS GRIFFITH.

The aim of the instruction in German in the Modern Classical Course is to enable students to understand easily modern German authors, readily to comprehend German when spoken, and to use with facility oral as well as written German in the simple forms of discourse.

In the General Science and Engineering courses, the aim is to impart a reading knowledge of scientific German; thus enabling students to read German scientific works in connection with their special line of study.

In the English and Civic-Historical courses, students are given a reading knowledge of German historical and philosophical literature, thus enabling them to make use of German books on these subjects.

In the Ancient Classical Course the aim is to give in a short time a reading knowledge of classical German.

1. Grammar. Required of Freshmen, English and Civic-Historical courses, fall and part of winter term. Miss REMINGTON and Miss GRIFFITH: *M., W., F., S., at* 10, and Assistant Professor WILKENS and Miss REMINGTON: *Tu., W., Th., S., at* 11.

2. Reader. Required of English and Civic-Historical Freshmen and Sophomores. Winter and spring terms of Freshmen and first term of Sophomore year; *M., W., F., S., at* 10, and *Tu., W., Th., S., at* 11. Miss REMINGTON.

3. Reader of Literature. Required of Modern Classical Freshmen. *Throughout the year; M., Tu., W., Th., at* 12. Professor ROSENSTENGEL.

4. Wilhelm Tell, Hermann und Dorothea, and Maria Stuart. Required of Modern Classical Sophomores. *Throughout the year; Th., S., at* 10. Professor ROSENSTENGEL.

5. Nathan der Weise, Wallenstein, and Iphigenie. Elective for Modern Classical Juniors. *Throughout the year; M., W., F., at* 9. Professor ROSENSTENGEL.

. Tasso, Faust, and brief sketches of typical figures from the history of German literature from the beginning of the 16th to the end of he 18th century. Elective for Modern Classical Seniors. *Throughout the year; M., W., F., at* 11. Professor ROSENSTENGEL.

8. Grammar, Reader and Classical German. Required of Ancient Classical Sophomores. *Throughout the year; M., W., F., S., at* 9. Assistant Professor WILKENS.

9. German Science Reader and Scientific Monographs. Required of General Science and Engineering Freshmen. *Throughout the year; M., W., Th., S., at* 10, and *M., Tu., W., Th , F., at* 11. Miss STERLING.

10. German Scientific Monographs. Elective for General Science and Engineering Sophomores, but required of those who have not, during their Freshman year, gained a reading knowledge of scientific German satisfactory to the instructor; *Tu., Th., S., at* 12, and *M., W., F., at* 12. Miss STERLING.

11. Selections from German historical and philosophical writers. Required of English and Civic-Historical Sophomores during the winter and spring terms; *Tu., W., F., S , at* 9, and *Tu., W., Th., F., at* 8. Miss REMINGTON.

14. Middle High German, Old High German, and Gothic. Elective for students that have finished Courses 1, 2, 3, 4, and 5, or their equivalents, and for graduates; *Th., S., at* 11, *and F., at* 12. Assistant Professor WILKENS.

15. Seminary (philological). It will be devoted to a close study of special subjects relating to the structure and growth of the Germanic language, and to problems of Middle High German and Old High German literature. Open to graduates and students who have had suitable preparation; *Tu., Th., at* 9, and *M., at* 3. Assistant Professor WILKENS.

16. History of German Art. Lectures on the History of German Art from the oldest period to the time of the Renaissance with special reference to to the history of civilization in Germany. *Once a week during the winter and spring terms.* Assistant Professor WILKENS.

17. Synoptical Lectures. The purpose of these is to present the most important periods in the progress and development of the German languages and literature in the middle ages; *F.*, *at* 4, *during the fall term.* Assistant Professor WILKENS. (This course will not be given during the year 1894.)

20. Conversation and Composition. Readiness in a correct use of the German language, oral and written, is the aim. Elective; *Tu.*, *Th.*, *at* 11, and *F.*, *at* 12. Professor ROSENSTENGEL.

21. Seminary (didactic). Elective for advanced students who intend to teach German; three times a week during the third term, at the convenience of those concerned. Professor ROSENSTENGEL.

FRENCH.

PROFESSOR OWEN, MISS GAY, AND MR. GIÈSE.

1. Elementary Course for Modern Classical Students. Otto's French Conversation Grammar, Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the class-room), Le Cid, Le Misanthrope, Athalie. *Throughout the year; M.*, *W.*, *F.*, *S.*, *at* 9. Miss GAY.

2. Elementary Course for Ancient Classical Students. The same as 1 with the addition of lectures on the history of the French Language, consideration of Latin etymologies, and treatment of the subject generally from the standpoint of the classics. Additional material for translation will be assigned as the progress of the class allows. *Throughout the year; M.*, *W.*, *F.*, *S.*, *at* 9. Miss GAY.

3. Elementary Course for Science Students. The same as 1, but with the omission of such portion (usually Athalie and Petite Fadette) as the needs of the class suggests.—*Throughout the year; Tu.*, *W.*, *F.*, *S.*, *at* 10; *M.*, *Tu.*, *W.*, *Th.*, *F.*, *at* 11. Miss GAY; *M.*, *Tu.*, *Th.*, *F.*, *at* 10, 11, and 12. Mr. GIESE.

As many students desire a reading knowledge only, the effort of the above elementary courses is concentrated upon reading. Students are expected at the end of any elementary course to read with sufficient ease and accuracy to make a practical use of French text-books in the prosecution of their other studies.

[4. Composition, etc. Written translation into French of the English exercises in Otto's Grammar, oral translation into French of Howard's Aids to French Composition, lectures in French on the history of the language, and recitations in French on the same, lectures in French on the early literature of the language, recitations in French from Demogeot's History of French Literature, reading independently for examination an abridgement of Les Trois Mousquetaires of Dumas and other easy French to be assigned. *Throughout the year; M., Tu., W., Th., F., at* 8. Professor OWEN. (Given in 1894–95.)]

5. Advanced Reading and Syntax. Reading in class parts of Cinq-Mars, Ursule Mirouet, Travailleurs de la Mer, La Fontaine's Fables, etc., reading independently for examination the Histoire de Charles XII. and other easy French to be assigned. *Throughout the year; M. Tu. W. Th. F., at* 8. Professor OWEN. Given in 1893–94.

Courses 4 and 5 will be given in alternate years, beginning with sub-course 4 in the collegiate year 1892–93.

Conversation. This exercise is open only to students who have finished Course 1, 2, or 3 or an equivalent. *Two hours a week throughout the year.* MR. GIESE.

6. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1893–94, on Comparative Syntax, or Thought-structure and Sentence-structure, with special reference to the French and English languages. *Winter term; F., at* 4. Professor OWEN.

Students under the Romance group system will so far as possible take Course 1 in Freshman year. Such students will be able to arrange studies for the remaining years, as follows:

Sophomore Year.

A. Independent reading of Course 5; Spanish or Italian. ..or.. B. *Independent reading of Course 4; Italian or Spanish.*

Junior Year.

C. Course 4 without the independent reading; Spanish or Italian. ..or.. D. *Course 5 without the independent reading; Italian or Spanish.*

Senior Year.

E. Course 4.....or.....F. *Course 5.*

Studies printed in *Italics* alternate with those printed in Roman. Elections accordingly follow the order A—D—E or the order B—C—F.

SPANISH.

PROFESSOR OWEN AND MR. GIESE.

1. Elementary. Translations into English of the Spanish exercises in Saur's Conversation Grammar and of Castelar's Historia del año 1883. *Throughout the year; M., Tu., Th.,* 5; hours subject to change at the opening of each term. This course is given during the year 1893-94.

[2. Advanced. Reading of selections from Cervantes (Don Quixote), from Calderon (El Magico Prodigioso), and from modern poets. *Throughout the year; two hours weekly.* Mr. GIESE. To be given in 1894-95.]

ITALIAN.

PROFESSOR OWEN.

[1. Elementary. Translation into English of the Italian Exercises in Sauer's Conversation Grammar, and of Manzoni's I Promessi Sposi, half study for the year. This course is in general like that in Spanish, with which it alternates. It will be given in 1894-95.]

ENGLISH LANGUAGE AND LITERATURE.

PROFESSOR FREEMAN, ASSISTANT PROFESSOR HUBBARD, AND MR. PYRE.

I. Language.

1. Anglo-Saxon and Middle English. An introduction to the historical study of English. *Throughout the year; M., W., F., at* 9. Required in the English Course, Sophomore or Junior year. Assistant Professor HUBBARD.

2. Anglo-Saxon Poetry. Study of selections; survey of Anglo-Saxon literature. *Fall term; Tu., W., F., at* 8. Open to students who have completed Course 1. Assistant Professor HUBBARD.

3. Advanced Anglo-Saxon. Beowulf; Introduction to the study of Old Germanic Life. *Winter and spring terms: M., W., F., at* 8. Assistant Professor HUBBARD.

[4. History of the English Language. A general course. Recitations and lectures. *Fall term; M., Tu., Th , F., at* 10. Open to all students of Sophomore standing. To be given in 1894-95. Assistant Professor HUBBARD]

II. Literature.

5. General Survey of English Literature. Recitations and study of representative masterpieces. This course is prerequisite to all other courses in English Literature. *Throughout the year; M., W., F., at* 9 *and* 11. Required of Sophomores in the English Course. Mr. PYRE.

6. Chaucer and Langland. History of the literature of the XIV. and XV. centuries. *Spring term; M., Tu., Th., F., at* 10. Assistant PROFESSOR HUBBARD.

7. The Literature of the Elizabethan Period. *Fall term; M., T., W., Th., at* 10. Given in 1893-94, omitted in 1894-95. Professor FREEMAN.

8. The Eighteenth Century. Study of the literature of the period with special reference to the social and intellectual life of the time. *Winter term; M., Tu., W., F., at* 10. Given in 1893-94, and omitted in 1894-95. Assistant Professor HUBBARD.

[9. The English Romantic Movement. *Three times a week during the fall term.* To be given in 1894-95. Mr. PYRE.]

[10. The Victorian Era. *Winter term; M., Tu., Th., F., at* 10. To be given in 1894-95. Assistant Professor HUBBARD.]

[11. The Ancient Classical Drama in translation, as an introduction to the Romantic Drama. *Fall term; M., W., at* 10.]

[12. History of the English Drama. Lectures and collateral reading. *Fall term; Tu., Th., at* 10. To be given in 1894-95. Professor FREEMAN.]

[13. Shakespeare. Selected plays. Interpretative readings, theses and discussions. *Winter and spring terms; M., Tu., W., Th., at* 9. To be given in 1894-95. Professor FREEMAN.]

14. The Epic. (a) Homer, Virgil and Dante in translation, as types of the Epic, and as an introduction to the study of Spenser and Milton. *Winter term; M., W., F., at* 9. (b) Spenser. *Spring term; M., W., F., at* 9. (c) Milton. *Fall term; M, Tu., W., Th., at* 9. Professor FREEMAN.

15. English Lyric Poetry. *Winter and spring terms; M., Tu., W., Th., at* 10. Professor FREEMAN.

16. The Development of the Novel. *Fall term; M., W., F., at* 9. Professor FREEMAN.

17. The Development of English Prose. *Fall term; M., Tu., W.. F., at* 10. Given in 1893–94. Assistant Professor HUBBARD.

[18. The English Essayists, from Dryden to the present day. *Three times a week during the winter and spring terms.* To be given in 1894–95. Mr. PYRE.]

19. English Prose Masterpieces. *Spring term; M., Tu., W., Th., at* 11. Professor FREEMAN.

[20. American Prose Masterpieces. *Spring term; M., Tu., W., Th., at* 11. To be given in 1894–95. Professor FREEMAN.]

21. English Literature Seminary. Subject for 1893–94: The History and Theory of Literary Criticism; subject for 1894–95, Robert Browning. Two hours a week in one session throughout the year. Open to graduate students and properly qualified Seniors. *Tu.*, 4–6. Professor FREEMAN and Assistant Professor HUBBARD.

[22. Synoptical Lectures. Two courses on the history and development of English literature in its several periods. Given in 1892–93 and 1894–95. Professor FREEMAN and Assistant Professor HUBBARD.]

RHETORIC AND ORATORY.

PROFESSOR FRANKENBURGER, ASSISTANT PROFESSOR KNOWLTON, MR. CAIRNS, AND MR. SAUNDERSON.

1. Rhetoric. Study of fundamental principles, analysis of themes, paragraph formation; with. frequent exercises in the various kinds of discourse, description of engineering structures and machines. Text-books: Genung's Outlines of Rhetoric, and Spencer's Philosophy of Style. *Three times a week during the year.* Assistant Professor KNOWLTON.

2. Rhetoric. Analysis of themes, fundamental qualities of style, paragraph formation and study of literary types, with daily exercises in composition. Text-books: Hill's Principles of Rhetoric or Genung's Outlines of Rhetoric, and Hill's Foundations of English or Abbott's How to Write Clearly. *Throughout the year.* The class meets in divisions; C.-H., *Tu.. Th., at* 9; Eng., *Tu., Th., at* 10; M. C., *W., S., at* 11; G. S., *Tu., F., at* 10; A. C., *W., S., at* 10; Engineers, *M., W., F., at* 12. Assistant Professor KNOWLTON and Mr. CAIRNS.

3. Rhetoric. To follow Course 2. Exercises in debates, essays, orations, with personal criticism. Text-book: Genung's Practical Rhetoric, with supplementary readings from English masterpieces, with lectures on rhetorical criticism. *Twice a week during the year.* Professor FRANKENBURGER, Assistant Professor KNOWLTON, and Mr. CAIRNS.

4. Philosophy of Rhetoric. Open to those who have completed Courses 2 and 3, above. Analysis of great orations, essays, and debates, with higher rhetorical and literary criticism. Orations, discussions, and lectures by members of the class. Text-book: D. J. Hill's Science of Rhetoric, and lectures with supplementary readings. *Throughout the year, M., W., F., at* 12. Professor FRANKENBURGER.

5. Rhetoric. A special course for students in the College of Engineering who have completed the required rhetoric. This course, which is designed to be purely practical, is to aid the student clearly to express his views on scientific and technical questions that may present themselves in the actual practice of his profession. *Once a week during the year.* Assistant Professor KNOWLTON.

6. Elocution and Dramatic Reading. Bell's Principles of Elocution, with lectures and gesture; declamation, with personal criticism; dramatic reading, Macbeth and Othello, or Julius Cæsar and Hamlet. Open to those who have taken Course 8 or its equivalent. *Twice a week throughout the year.* Professor FRANKENBURGER.

7. Elocution. Voice culture, reading, declamations, orations. and gesture exercises. Lectures will be given upon vocal physiology, the proper use and care of the voice, reading, and gesture. *Throughout the year; M., W., F.* Mr. SAUNDERSON.

8. Oratorical Delivery. Open to those who have had sufficient previous preparation to be able to do the work. Declamations and reading from the works of the great orators. Lectures upon the principle of gesture and of oratorical delivery. *Winter term; M., W., F.* Mr. SAUNDERSON.

9. Phonetics. Bell's System of Visible Speech. *Fall term; twice a week.* MR. SANDERSON.

10. Elocution and Oratory. (Elective in Law School.) Voice training for effective quality; special drill on methods of reading statutes and other documents before a court or a jury. Practice in declamation and reading from the great orators, and in extempore speaking. Lectures on vocal physiology, on the use and care of the voice, and on principles of gesture. *Twice a week during the year.* Mr. SAUNDERSON.

11. Elocution. (Elective in College of Engineering.) Voice training, and plain reading and speaking of the kind most needed by business and professional men. Lectures upon the use and care of the voice, and upon the principles of effective reading and speaking. *Winter term; three times a week.* Mr. SAUNDERSON.

MATHEMATICS.

PROFESSOR VAN VELZER, PROFESSOR SLICHTER, MR. SKINNER, DR. VAN VLECK, MR. STECKER, AND MR. KUHN.

1. Algebra. Progressions, arrangements and groups, binomial theorem, theory of limits, undetermined co-efficients, derivatives, series, and logarithms. Text-book: Van Velzer and Slichter's University Algebra. *Fall term; M., Tu., Th., F., at* 9. Mr. SKINNER. *M., W., F., S., at* 9. Dr. VAN VLECK and Mr. KUHN. *M., T., Th., S., at* 10. Dr. VAN VLECK. *M., W., Th., S., at* 11. Mr. STECKER.

2. Algebra. Imaginaries, rational integral functions of one variable, solution of numerical equations of higher degrees, and graphic representation of equations. *Winter term; same text, same divisions, and same hours as Course* 1.

3. Trigonometry. In this course the ratio system is used exclusively. The greater part of the term is devoted to plane trigonometry, special stress being laid on geometry. Spherical trigonometry occupies about three weeks of the term. *Spring term; same divisions and same hours as Course* 1.

4. Theory of Equations and Determinants. This course is a continuation of Courses 1 and 2, but must be preceded by Course 3. *Two exercises a week for one year.* Mr. SKINNER.

5. Analytic Geometry. Straight line, conic sections, general equations of the second degree, transcendental curves, and an introduction to geometry of three dimensions. *Fall term; M., Tu., W., Th., F.* Dr. VAN VLECK.

6. Calculus. The leading subjects treated are: Differentiation and integration of functions of one variable, expansion in series, indeterminate forms, maxima and minima, with the usual application to the lengths of curves, areas of curves and surfaces and of revolution, volumes of solids of revolution, etc. *Winter and spring terms; M., Tu., W., Th., F.* Dr. VAN VLECK.

7. Advanced Calculus. Partial derivatives and multiple integrals with their usual geometric applications. *Two exercises a week during the fall term.* Professor VAN VELZER.

8. Differential Equations. Solution of ordinary and partial differential equations, with a few geometric and mechanical applications. Must be preceded by Course 7, or taken along with it. *Three exercises a week for one year.* Professor VAN VELZER.

9. Higher Trigonometry. *Two exercises a week for winter and spring terms.* Must be preceded by Course 6. Mr. SKINNER.

[10. Modern Algebra. *Two exercises a week for one year, in alternate years.* Must be preceded by Course 4. This course will be given in 1894–95. Professor VAN VELZER.]

11. Theory of Groups. *Three exercises a week for one year, in alternate years.* This course is given in 1893–94. Professor VAN VELZER.

12. Analytic Geometry of Two Dimensions. Modern methods in plane analytic geometry. *Three exercises a week for one year.* Must be preceded by Course 5. In the year 1893–94 this course, together with Course 14, is given as one course five times a week for the year. Professor VAN VELZER.

13. Projective Geometry. *Two exercises a week for one year.* In the year 1893-94 this course is given three times a week for two terms. Dr. VAN VLECK.

14. Analytic Geometry of Three Dimensions. *Three exercises a week for one year.* Should be preceded by Courses 7 and 12. In the year 1893-94 this course, together with Course 12, is given as one course five times a week. Professor VAN VELZER.

[15. Quaternions. *Two exercises a week for one year in alternate years.* This course will be given in 1894-95. Mr. SKINNER.]

16. Theory of Functions. *Three exercises a week for one year in alternate years.* This course is given in 1893-94. Dr. VAN VLECK.

17. Theoretical Mechanics. An elementary course in analytical mechanics. Elective for students who have taken calculus. *Throughout the year; M, W., F., at* 11. Professor SLICHTER.

18. Newtonian Potential Function. Lectures and required readings on the theory of potential, with an introduction to spherical harmonics. *Throughout the year; Tu., Th., at* 4. Professor SLICHTER.

19. Partial Differential Equations of Mathematical Physics. Based on Riemann's Lectures. *Throughout the year; twice a week.* Professor SLICHTER.

20. Theoretical Hydrodynamics. Lectures on fluid motion. *Throughout the year; Tu., Th., at* 11. Professor SLICHTER.

The last two courses are for advanced students, and both cannot be given in the same year.

21. Synoptical Lectures. A sketch of the growth of mathematics from the earliest times to the present. *Winter term; W., at* 4. This course will not be given in 1894-95. Professor VAN VELZER.

22. Synoptical Lectures. A course of lectures on the laws of chance. *Spring term; Tu., at* 4. This course will not be given in 1894-95. Professor SLICHTER.

Advanced Courses. To graduates and others prepared to take them, courses will be given in definite integrals, advanced differential equations, elliptic functions, Abelian functions, theory of numbers and higher plane curves.

ASTRONOMY.

PROFESSOR COMSTOCK.

1. General Astronomy. Fundamental concepts of astronomy and the more important problems associated with them, so far as the latter admit of treatment by elementary methods. *Fall term; five times a week.* Text-book: Young's General Astronomy, with collateral reading.

2. General Astronomy. A continuation of the work of 1, with special reference to modern developments in astronomical physics. *Winter term; five times a week.*

3. Observatory Work and Methods. This course is designed to give to the student some familiarity with the principal astronomical instruments and the methods of employing them in research. It will require attendance at the observatory for two consecutive hours five times a week during the spring term, and the nature of the work requires that a part of the exercises shall fall in the evening hours.

   The above work can be undertaken only by students who have completed a course in general physics and the mathematics of the Freshman year. The mathematics of the Sophomore year must either precede or be taken concurrently with the above subcourses.

4. Theoretical Astronomy. This course presupposes in the student a working knowledge of the infinitesimal calculus and the elements of dynamics. Integration of the equations of motion and the application of the resulting elements to the computation of ephemerides (fall term). Determination of the elements of an orbit from observation (winter term). Theory of special perturbations (spring term).

5. Synoptical Lectures. A course of weekly lectures on the growth and present state of astronomy was given during the fall term of the year 1893–94.

   Graduate students and others desiring to pursue advanced astronomical studies will be received in the Washburn Observatory as assistants and will take part in the regular series of observations with the equatorial telescopes or with the meridian circle, at the same time continuing their theoretical studies. Facilities for independent original work will be afforded to such students, and their work, if

of sufficient value, will be printed in the publications of the Washburn Observatory. Eight volumes of these publications, representing the work of the observatory prior to 1890, have already been issued.

For other courses of instruction consult the title Astronomy, in the announcement of the College of Mechanics and Engineering. See, also, the title Washburn Observatory.

PHYSICS.

General Physics. PROFESSOR SNOW AND DR. AUSTIN.
Mathematical Physics. PROFESSOR DAVIES.

1. General Lectures. Mechanics and Heat. Electricity and Magnetism. Acoustics and Optics. Required of students in Ancient and Modern Classical, Civic-Historic, English, General Science and Engineering courses. Two lectures a week. *Throughout the year.* Two sections; *M., W., at* 12; *Tu., Th., at* 12. Professor SNOW. One recitation on Friday or Saturday by the class in smaller sections, at hours to be assigned. Professor SNOW and Dr. AUSTIN.

This course is intended for those taking up the study for the first time, or for those who have studied it only in an elementary manner. A knowledge of plane trigonometry, including the use of logarithms, is required for registration in this course.

2. Introductory Laboratory Practice. An introduction to the theory and methods of physical measurements.

This course is intended to accompany Course 1, and is required of all students in the above courses, with the exception of the Ancient and Modern Classical courses and Electrical Engineers. *Throughout the year; twice a week; hours to be assigned.* Dr. AUSTIN.

2a. Similar to the above. Required of students in Electrical Engineering. *Throughout the year; once a week; hours to be assigned.* Dr. AUSTIN.

3. Advanced Laboratory Practice. Presupposes the completion of Courses 1 and 2, or their equivalents. Required of students in the Physics Group. *Throughout the year; three times a week.* This course may also be elected as a full study throughout the year. *Hours to to be assigned.* Professor SNOW and Dr. AUSTIN.

It is desired in this course to give the student further practice in careful physical manipulation, and to acquaint him with the most accurate methods employed in the determination of physical constants.

4. Thesis Work. Required of Seniors in the Physics Group. Full study throughout the year. Professor SNOW and Dr. AUSTIN.

   At the beginning of the fall term, the student is expected, with the advice of the instructors, to take up some special line of investigation which is to be conducted, under the direction of those in charge of the department, throughout the year. Not only are the facilities of the laboratory placed at the command of these students, but, as occasion may require, any piece of special apparatus necessary to the carrying out of their investigations will be secured.

5. Electrical Measurements. A laboratory course in the exact determination of electrical quantities. *Full term; twice a week. Hours to be assigned.* Required of Juniors in Electrical Engineering. Professor SNOW.

6. Precision of Measurements. A course involving the highest accuracy attainable in making determinations of electrical constants and magnetic elements in absolute measure. *Winter term; three times a week. Hours to be assigned.* Required of Juniors in Electrical Engineering. Professor SNOW.

[7. An Introduction to the Study of Mathematical Physics. This course of lectures will treat of the fundamental equations of theoretical physics, and will be preparatory to the more advanced courses offered by Professor Davies and Professor Slichter. A knowledge of analytical geometry and calculus will be required for registration. *Throughout the year, T., Th., at* 9. Required of students in the Physics Group 1894–95. Dr. AUSTIN.]

[8. Mathematical Theory of Sound. An exhaustive mathematical treatment of the subject of acoustics. This course presupposes the equivalent of Course 7. A knowledge of differential equations will also be required. *Throughout the year; M., W., F., at* 2. Professor DAVIES.]

9. Practical Photography. Two-fifths study during the spring term. This course is offered as an elective to all students desiring a knowledge of the subject, No previous preparation in physics will be required. *Spring term;* 2–6. Professor SNOW.

10. Colloquium. A class, meeting one evening each week, for the critical reading and discussion of the current periodical literature. Professor SNOW and Dr. AUSTIN.

11. Mathematical Physics. This course will include the study of special problems in higher geodesy; waves in elastic and other media, including electro-magnetic waves; sound and light. The study of normal functions as applied to the above subjects will be particularly thorough. Thomson and Tait's Natural Philosophy, Kirchoff's Vorlesungen über Mathematische Physik and other more recent works on theoretical physics will be used for reference. Professor DAVIES.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, MR. KAHLENBERG AND MR. ANDERSON.

1. General Elementary Chemistry. A daily exercise throughout the year, as follows:

   Fall term. Descriptive Inorganic Chemistry; lectures and laboratory work. *Lectures at* 2. Professor DANIELLS, Assistant Professor HILLYER and Mr. ANDERSON.

   Winter term. Qualitative analysis, with frequent reviews and class-room exercises. Assistant Professor HILLYER and Mr. ANDERSON.

   Spring term. Descriptive Organic Chemistry, lectures and laboratory work. Assistant Professor HILLYER and Mr. ANDERSON.

2. Advanced Inorganic Chemistry, second year. Quantitative work in determining the equivalence of elements, the densities of gases, the principles of gravimetric and volumetric analysis and their applications in the analysis of ores, crude metals, slags, technical products, and gases, together with one exercise each week in theoretical chemistry, the solving of chemical problems, and the history of chemistry. *Daily throughout the year.* The amount of time devoted to this subject may be more or less than that of a full study, and will be arranged upon consultation with the instructors. Professor DANIELLS and Mr. KAHLENBERG.

3. Advanced Inorganic Chemistry, third year. The amount of time and the character of the work will be arranged upon consultation with the instructors. Besides the work re-

quired for a graduation thesis, it may consist of advanced work in theoretical, physical, or analytical chemistry, or in research work. Professor DANIELLS and Mr. KAHLENBERG.

4. Advanced Organic Chemistry. Reviews and expansion of the work of the elementary course, with laboratory work mainly in the preparation of aromatic compounds, accompanied by special work on assigned topics. *Full study; fall term.* Assistant Professor HILLYER.

Organic analysis, determination of physical constants, special and research work with preparation of thesis. *Full study for winter and spring terms.* Assistant Professor HILLYER.

The division of time between organic and inorganic chemistry for the Junior and Senior years will be made after consultation with the instructors.

Students wishing to become practical chemists, physicians, teachers, etc., will so far as is possible begiven work that will be of greatest service in accomplishing the end they have in view.

5. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1893-94.

Twelve hours' laboratory work a week is regarded as the equivalent of a full study.

The chemical library is well supplied with works of reference and with chemical periodicals, enabling students to familiarize themselves with the most recent investigations bearing upon the work in hand.

Instructors and advanced students will meet weekly during the year to report on articles in the current chemical journals and on assigned topics suggested by recent work in chemistry. Nearly all the more important chemical journals are accessible for use in this work, and the department library is steadily growing by accessions of the best books of reference.

MINERALOGY, PETROLOGY, AND GEOLOGY.

PROFESSOR VAN HISE, ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

Preparatory to a two-years' course in the above subjects a reading knowledge of both German and French is desirable, German being especially important. Biology and chemistry should be taken

in the Freshman and Sophomore years. It is also advised that physics be taken in the Sophomore year if practicable. All students intending to take work in geology should if possible the previous year take mineralogy 2 during the fall term, and a longer course in this subject is a very advantageous preparatory study to a long course in geology.

Under the Group system two lines of work are offered. One of these emphasizes geology proper; the other emphasizes mineralogy and petrology. The outline of these courses is as follows:

Mineralogy and Petrology.	Geology.
Junior Year.	
Mineralogy 1. (Assigned study geology 1, 2 and 4.)	Geology 1, 2, and 4. (Assigned study mineralogy 1.)
Senior Year.	
Petrology 4 and 5. (Geology 5 will constitute a part of the assigned work.	Geology 3, 5, and 6. (Assigned study petrology 4.)

MINERALOGY AND PETROLOGY.

ASSISTANT PROFESSOR HOBBS.

1. General Course in Mineralogy. Full study throughout the year divided into three parts, viz.: General Mineralogy, Optical Mineralogy, and Blowpipe Analysis:

   Part 1. General Mineralogy. Recitations and practicums in crystallography, lectures and quizzes on physical and chemical mineralogy, and lectures and practical work in systematic and descriptive mineralogy.

   Part 2. Blowpipe Analysis. The blowpipe characteristics of the elements, analysis of simple compounds and determination of minerals by use of Brush's tables.

   Part 3. Optical Mineralogy. Lectures followed by laboratory work with the petrographical microscope, each student being supplied with one for his special use.

   Extra work, embracing goniometrical measurements, crystal drawing, special reading in English and German works and extra hours in laboratory, will be assigned to Group stud nts in mineralogy. Required of students who take petrology or geology under the Group system. *Fall term; M., T., W., Th., F., at* 11. *Winter and spring terms,* 8-10.

2. Short Course in Mineralogy. General mineralogy is treated during the fall term and blowpipe analysis during the winter term.

Required of all civil engineers. *Fall term; M., Tu.*, W., *Th., F., at* 10 (Sophomore year). *Winter term; T., F.*, 9–11 (Junior year).

3. Blowpipe Analysis and Determinative Mineralogy. This course consists almost entirely of laboratory work. It can be adapted to the needs of pharmacy students and may be made either a three-fifths or a full study. *Winter term*, 8–10.

4. Petrology 1. Must be preceded by Course 1. A few lectures followed by laboratory work with the microscope on the petrology of the crystalline rocks. Required of Group students in geology or petrology. *Fall term; M., Tu., T.; Th., F.*, 2–4.

5. Petrology 2. The petrology of the crystalline rocks, including lectures and laboratory work. A month at the end of the spring term will be generally spent in camp in Northern Wisconsin or Michigan studying crystalline rocks in the field. A full study of some original problem and a thesis upon the same will be expected of students in this course. Required of Group students in petrology. *Throughout the year; M., Tu., T., Th., F.*, 2–4.

GEOLOGY.

PROFESSOR VAN HISE AND ASSISTANT PROFESSOR CLEMENTS.

1. General Geology. The geological forces and the work they accomplish; the geography of the continents; the effects of land relief, water areas, and rivers upon the distribution of peoples; rocks, and their original and secondary structures. A series of synoptic lectures on historical geology. Required of Group students in petrology and geology, and Seniors in Civil Engineering. Text-book, Geikie's Class Book of Geology. *Fall term; M., Tu., W., Th., F., at* 12. Professor VAN HISE.

2. Historical Geology. Special emphasis is given to the history of the North American Continent, including both its physical and life development. Lecture room and laboratory

work. Must be preceded by Course 1. Required of Group students in petrology and geology. *Winter term; M., Tu., W., Th., F., at* 12 *and* 4. Assistant Professor CLEMENTS.

3. Systematic Paleontology. Special stress will be placed upon invertebrate paleontology. Students will be offered the opportunity of becoming familiar with the most characteristic fossils by examination in the lecture room and more detailed study in the laboratory. Required of Group students in geology. *Winter term; M., Tu, W., Th., F., at* 8 *and* 4. Reference books: Nicholson & Lydekker's Manual of Paleontology, and national and state geological reports. Assistant Professor CLEMENTS.

4. Field Geology. The work of this course the present year is the systematic platting on a large scale of the rock outcrops adjacent to Madison. The study includes a consideration of the physical and paleontological data for correlating the outcrops of the different formations, and for placing them at definite positions in the geological time scale. Must be preceded by Courses 1 and 2. Required of Group students in geology and petrology. *Spring term; F.*, 2–6; *S.*, 9–1, 2–6. Professor VAN HISE and Assistant Professor CLEMENTS.

5. Applied Geology. Treats of the geology of potable water, structural materials, soils, mineral fuels, and ore deposits. A report upon an assigned topic is required of each student. Must be preceded by Course 1. Required of Group students in petrology and geology, and of Seniors in Civil Engineering. *Spring term; M., Tu., W., Th., F., at* 12. Professor VAN HISE.

6. Advanced and graduate courses in geology are offered. The character of the work is adapted to the individual students. Special facilities are offered in physical geology and pre-Cambrian geology by Prof. Van Hise, in paleontology by Prof. Clements, and in petrology by Prof. Hobbs. The work of the class in the fall term of 1893 was the preparation of a detailed map of the lake shore phenomena and Pleistocene formations adjacent to Madison, and a study of physical geology, Jukes-Brown's Handbook being used as a basis. Must be preceded by Courses 1, 2 and 4 in geology, and 1 and 4 in mineralogy and petrology. Re-

quired of Group students in geology as a minimum, one term's work and a thesis. Time to be arranged with instructor.

7. Synoptical Lectures. The courses running through the year include mineralogy and petrology by Prof. Hobbs, systematic paleontology by Prof. Clements, and physical geology by Prof. Van Hise. Given in 1893-4, and alternate years thereafter. *M., at* 4.

BIOLOGY.

PROFESSOR BIRGE, PROFESSOR BARNES, ASSISTANT PROEESSOR RUSSELL, DR. MILLER, DR. MARSHALL AND MR. CHENEY.

1. General Biology. Introductory to both botany and zoology, and required as preliminary to all advanced work in either department. Two recitations a week from Parker's Biology and ten hours' weekly of laboratory work, using as a hand-book Huxley and Martin's Elementary Biology.

   The recitations are given in the afternoon, at 3 in the fall term, 2 in winter and spring terms. The class meets in two divisions, *M., W.; Tu , Th.* Professor BARNES and Professor BIRGE. For laboratory work the class is divided into two or three sections, each meeting for two hours daily. Dr. MARSHALL. Required of Freshmen in General Science Course.

2. Vertebrate Anatomy. Dissection of typical vertebrates and recitations from Wiedersheim's Anatomy of Vertebrates. Full study, fall and winter terms: Students desiring additional laboratory work may begin it during the spring term of the preceding year. *Hours on consultation.* Dr. MILLER.

3. Invertebrate Zoology. A general course in the morphology and classification of Invertebrates. The work will be on Arthropoda in the fall term, Mollusca in the winter term, and Vermes in the spring term. Text-book: Shipley's Zoology of the Invertebrata. *Full study for the year. Hours on consultation.* Professor BIRGE.

4. Human Physiology. Three recitations weekly are given to the study of Martin's The Human Body. *Fall and winter terms; M., W., F., at* 8. Professor BIRGE.

   This course may be followed in the spring term by Hygiene 2.

5. Animal Histology. Short course. Open only to students taking course 4. *Fall and winter terms; Tu., Th., at* 8. Dr. MILLER.

6. Animal Histology. Long Course. Laboratory work in the preparation of the more important tissues and organs, accompanied with lectures and recitations. *Full study, fall term. Hours on consultation.* Dr. MILLER.

7. Animal Embryology. Three lectures and ten hours' laboratory work weekly. The development of the chick during the first three days is studied. Text-books: Foster and Balfour's Embryology, Hertwig's Embryology. *Spring term. Hours on consultation.* Dr. MILLER.

8. Thesis Work in Histology, Zoology, or Embryology. Required of group students in Zoology. The work should be begun during the Junior year. An opportunity will be given for thesis work during the session of the Summer School in July, 1894.

15. General Morphology of Plants. The course is recommended only as a sequel to 1. Its aim is, by a study of the structure of various types of plants, to fill out and complete the student's idea of the forms of vegetable life. To this end such plants will be used as supplement those in Course 1. In the spring term attention will be given to collecting and naming such groups of plants as each student my select for his special study. Ten hours a week throughout the year. *Daily; hours on consultation.* Professor BARNES.

16. Vegetable Histology. Systematic study of the tissues orphan-erogams and ferns. Use of reagents and stains, modes of imbedding, section cutting and mounting. Ten hours a week, two terms. Laboratory guide: Strasburger's Practical Botany. *Daily; hours on consultation.* Professor BARNES and MR. CHENEY.

17. Organogeny and Embryology. A study of the development of organs and the embryo. Offered *only* in connection with Course 16. *Daily; hours on consultation.* Professor BARNES.

18. Vegetable Physiology. A course in experimental physiology, supplented by reference readings. Biology 15, or 16 and 17, Chemistry 1, and Physics 1 and 2 must precede this, and it

is very desirable that those taking it should be able to read German readily. The necessary observations sometimes require extra time and work at unusual hours, which those taking the course should be willing to give. Ten hours a week throughout the year. Reference books: Detmer's Pflanzenphysiologisches Praktikum, Vines' Lecture on the Physiology of Plants. *Daily; hours on consultation.* Professor BARNES.

19. Bryology. The large collections of mosses and of the literature relating to their classification offer unusual facilities for special and original work in the study of the moss flora. The course is offered only to advanced students who can devote considerable time to its prosecution, and no credit will be given for less than a year's work. Work will usually be assigned in the determination of general collections during the first term. In the last two terms the students will be given small groups to examine critically. Ten or fifteen hours a week throughout the year. Manuals: Lesquereux and James, Mosses of North America; Barnes, Keys to the Genera and Species of Mosses. *Daily; hours on consultation.* Professor BARNES.

20. General Morphology of plants. An elementary course designed primarily for Pharmacy students, but open to others who desire to begin the study of botany. *Fall term;* the form and structure of the vegetative organs of seek plants; *winter and spring terms;* the morphology of fungi, algæ, lichens, mosses, and ferns, illustrated by selected types; closing with a study of the flower of seed-plants. The course will be supplemented by botanical excursions, six in the autumn and ten in the spring. *Daily*, 9-11. Excursions on Saturdays. Mr. CHENEY.

21. Herbarium Work. Pharmacy students are required to prepare during the summer, and to present at the opening of their Senior year, a collection of 50 species of seed-plants from the vicinity of their homes, named and mounted; 25 of these are also to be fully described.

A duplicate of this collection in which the plants are named, but not mounted nor described, must also be presented; this will be retained by the University. Students will also be required to arrange a collection of drugs, authentic specimens being furnished by the University. Mr. CHENEY.

22. Anatomy of Drugs. Vegetable histology applied to the examination of commercial drugs. Course 10 must precede this. The drugs from collection required in Course 21 will be used. *Spring term; M., Tu., W., Th., F.*, 11-1. Mr. CHENEY.

23. Bacteriology. General course including the study of typical forms with microscope and cultures. Special attention will be given during the latter part of the term to the disease-producing organisms. Lectures and recitations, 2–3 hours; laboratory, 10 hours weekly. *Winter term; full study.* Assistant Professor RUSSELL.

24. Advanced Work in Bacteriology. Opportunity for advanced work in bacteriology will be given students who have had the general course. This work may be elected by the student during any term of the year. *Full study.* Assistant Professor RUSSELL.

[25. Synoptical Lectures. A course of synoptical lectures will be given during the year 1894–95.]

A Journal Club meets on alternate Thursdays for reviews of current biological literature.

Those who wish to pursue continuous work in botany for four years can do so by taking the courses in the following order: 1; 15; 16 and 17; 18: 1; 15, or, 16 and 17; 18; 19: or, 1; 16 and 17; 15; 18.

For those who expect to teach botany in high schools 1 and 15 are the *minimum* preparation desirable; they are recommended to take in addition course 20 in part as a review.

The course in general biology, 1, is to be taken by students in the Course system and as one of the basal studies by those making biology a major under the Group system. A major in biology can be made by adding to course 1 two years' work in either botany or zoology.

HYGIENE.

DR. ALMAH J. FRISBY.

1. Lectures on hygiene are given twice a week during the fall and winter terms. The course each term covers the subjects of sanitary sites and modes of construction of houses, ventilation and heating, drainage and sewerage, water sup-

ply, food and drink, exercise, clothing, care of the person, preservation of eyesight and hearing, communicable diseases, early treatment of emergencies.

Attendance upon these lectures during one term is required of all Freshmen and of special students in their first year.

The divisions meet as follows: *Fall term:* A. C. and M. C., *Tu* , *Th* , 8; Phar., *Tu.*, *Th.*, 11; G. S., *T.*, *S.*, 9. *Winter term:* C. H., *Tu.*, *Th.*, 10; Eng., *Tu.*, *Fri.*, 11.

2. Advanced Hygiene. A course in hygiene especially adapted for students who have taken Course 1 and Biology 4 (Physiology). Lectures and recitations based on Parkes' Practical Hygiene. *Spring term: M., W., F.*

MILITARY SCIENCE AND TACTICS.

LIEUTENANT MCGRATH.

This department of the University is maintained in accordance with United States and State statutes. By the regulations of the department, all the able-bodied male students of the Freshman and Sophomore classes, and of the special courses, except adult special students over twenty-two years of age, for the first two years of such courses, are required to take military drill.

The work of the department embraces a course in tactics, a course of lectures on military subjects and practical instruction in the school of the soldier, company, and battalion, and target practice. The class in tactics is organized November 1st of each year, and may be elected by both classes. All non-commissioned officers are required to take the course, which continues through the winter term. The course of lectures may be elected during the winter term of the Sophomore year. Commissioned officers are expected to take this course. The study value of tactics and the lecture course is that of a two-fifths and one-fifth study respectively.

Freshman who, prior to their entering the University, have received the equivalent of one year's instruction in the University battalion, will be required to drill during their Freshman year only; *provided*, that they furnish certificates from superintendents of military schools or commanding officers of military companies, setting forth in detail the military duty performed; that they are able at the opening of the drill seasen to give instruction in the school of the soldier; that they take the full course in drill regulations, maintaining a class standing of 90 per cent.; that

they waive all right of promotion, and that their conduct and deportment are thoroughly satisfactory during the year. All students ranking below Juniors, except adult specials over twenty-two years of age, no matter how extended may have been their previous military training, will be required to take one year's drill in the University battalion.

Drill for Freshmen begins at the opening of the fall term and is held four times a week until November 1st. Well-instructed Freshmen are assigned to duty as drill masters. A thorough knowledge of the school of the soldier is a prerequisite for such assignment. The drill is continued through the winter term and closes in May. The Sophomore privates commence drill November 1st, at which time the battalion is divided into two divisions, one division drilling Mondays and Wednesdays and one on Tuesdays and Thursdays.

The uniform of the battalion is prescribed by regulation, and can be obtained in Madison.

During the fall and spring terms the battalion is divided into four companies. During the winter term it is divided into five companies, the fifth being a crack company composed of members selected by the commandant from the four other companies. The crack company is made up of those who have distinguished themselves during the fall term by their proficiency, good conduct, and punctuality.

The battalion staff consists of an adjutant and a quartermaster, who rank as captains, and a sergeant-major. These officers are appointed March 1st. The following is the

ROSTER

of the other officers and non-commissioned officers of the University Battalion for the year 1893-94:

First Lieut. H. J. McGrath, 4th U. S. Cavalry, Commandant

Company A.—Captain, George Katzenstein; First Lieutenant, Harry J. Noyes; Second Lieutenant, John V. Green; First Sergeant, Orin E. Crooker; Sergeants, H. S. Markham, B. S. James, Henry Cochems and William Darrow; Corporals, J. S. Green and William Ruger.

Company B.—Captain, Benjamin J. Ochsner; First Lieutenant, Wm. L. Barton; Second Lieutenant, Edward C. Bebb; First Sergeant, Charles B. Hayden; Sergeants, R. C. Cornish, W. H. Mann, Leo. Torbe and P. F. Brown; Corporals, W. F. Hase and C. E. Schriber.

Company C.—Captain, George Thompson; First Lieutenant, Henry M. Trippe; Second Lieutenant, Joseph D. Maynard; First

Sergeant, Oliver B. Zimmerman; Sergeants, W. F. McGregor, J. S. Coe, A. E. Broenniman and H. W. Reilly; Corporals, S. D. Rumsey and R. B. Ramien.

Company D.—Captain, Louis M. Ward; First Lieutenant, Chris. H. Anderson; First Sergeant, Albert O. Wright; Sergeants, B. E. Tilton, S. L. Sheldon, C. F. Freeman and J. G. Graham; Corporals, C. A. Libby and J. M. Cantwell.

The names of the members of the crack company are: Sophomores, C. E. Blomgren, W. J. Conway, M. J. Gillan, D. R. Jones, J. H. Liegler, J. L. McNab, W. Michaels, D. H. Ramien, F. W. Ruka, H. A. Sawyer, S. B. Tarrant, I. P. Witter, L. R. Worden; Freshmen, O. F. Ball, M. C. Beebe, C. Brewer, E. H. Comstock, A. W. Fairchild, E. S. Hanson, R. W. Jackman, R. V. Kennedy, E. H. Kronshage, A. J. Latton, E. S. Lueth, G. M. Link, J. O. Miller, M. Montgomery, L. Owen, W. O. Rickfort, C. B. Rider, J. Rogers, P. H. Sawyer, W. A. Stowe, E. C. Tillotson, O. F. Waite, G. H. Williams, and D. H. Wright.

MUSIC.

PROFESSOR PARKER AND MR. SIRED.

The courses in music are open to students who show sufficient musical ability to pursue them with profit.

For admission to Course 1, no previous knowledge is required. Students may be admitted to advanced courses on examination. Those desiring to take Course 2 must be able to read and play simple four-part music. One or two terms' work in Course 1 will be found useful in strengthening preparation for the courses in Harmony and Counterpoint.

Special students may substitute private lessons in piano playing or singing for one or more studies on recommendation of their musical instructor. Classes meet in room 12, Ladies' Hall. Prof. Parker gives lessons in room 15, and Mr. Sired in room 5, Ladies' Hall.

1. Musical Theory and Choral Practice. *Fall and winter terms; Tu., Th., at* 5. Professor PARKER.

2. Elementary Harmony. *Throughout the year; Tu., Th., at* 4. Professor PARKER.

3. Advanced Harmony. *Fall and winter terms; Tu., Th., S., at* 10. Professor PARKER.

4. Counterpoint. *Spring term; Tu., Th., S., at* 10. Professor PARKER.

COLLEGE OF MECHANICS AND ENGINEERING.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL.D., President of the University.
STORM BULL, M.E., Professor of Steam Engineering.
JOHN E. DAVIES, A.M., M.D., LL.D., Professor of Electricity and Magnetism, and Mathematical Physics.
DUGALD C. JACKSON, C.E., Professor of Electrical Engineering.
FORREST R. JONES, M.E., Professor of Machine Design.
CHARLES I. KING, Professor of Mechanical Practice.
EDWARD R. MAURER, B.C.E., Assistant Professor of Pure and Applied Mechanics.
ARTHUR W. RICHTER, M.E., Assistant Professor of Steam Engineering.
FREDERICK E. TURNEAURE, C.E., Professor of Bridge and Hydraulic Engineering.
NELSON O. WHITNEY, C.E., Professor of Railway Engineering.
JOHN G. D. MACK, M.E., Instructor in Engineering.
LEONARD S. SMITH, B.C.E., Instructor in Engineering.
JAMES R. YOUNG, B.S., Instructor in Engineering.
WALTER J. RICHARDS, B.S., Fellow in Electrical Engineering.
JAMES HIGGINS, Foreman of Foundry.
WILLIAM LOTTES, Foreman of Blacksmith Shop.
JERE T. RICHARDS, Student Assistant in Wood Shop.
JOHN F. WILSON, Student Assistant in Wood Shop.

GEORGE C. COMSTOCK, PH.B., LL.B., Professor of Astronomy.
WILLIAM W. DANIELLS, M.S., Professor of Chemistry.
DAVID B. FRANKENBURGER, A.M., Professor of Rhetoric.
HOMER W. HILLYER, PH.D., Assistant Professor of Organic Chemistry.
WILLIAM H. HOBBS, PH.D., Assistant Professor of Mineralogy and Petrology.
AMOS A. KNOWLTON, A.M., Assistant Professor of Rhetoric.
HUGH J. MCGRATH, Professor of Military Science and Tactics.
EDWARD T. OWEN, A.B., Professor of French.
WILLIAM H. ROSENSTENGEL, A.M., Professor of German.

CHARLES S. SLICHTER, PH.D., Professor of Applied Mathematics.
BENJAMIN F. SNOW, PH.D., Professor of Physics.
CHARLES R. VAN HISE, PH.D., Professor of Geology.
CHARLES A. VAN VELZER, PH.D., Professor of Mathematics.
LOUIS W. AUSTIN, PH.D., Instructor in Physics.
LUCY M. GAY, B.L., Instructor in French.
ERNEST B. SKINNER, A.B., Instructor in Mathematics.
SUSAN A. STERLING, B.L., Instructor in German.

Special Lecturers.

ARTHUR V. ABBOTT, C.E., Chief Engineer of the Chicago Telephone Co. Lecturer on the Development of the Telephone Switch Board. Chicago, Ill.

CONRAD M. CONRADSON, M.E., Superintendent of Gisholt Tool Works. Lecturer on The Modern Machine Shop. Madison, Wis.

LOUIS A. FERGUSON, B.S., Electrical Engineer of the Chicago Edison Co. Lecturer on Modern Electric Light Stations. Chicago, Ill.

ELISHA GRAY, PH.D., LL.D. Lecturer on the Telautograph. Highland Park, Ill.

ROBERT M. HUNT, Past President Am. Soc. M. E., President Western Soc. Engineers. Lecturer on the Manufacture of Steel. Chicago, Ill.

T. T. JOHNSTON, Principal Assistant Engineer of the Chicago Drainage Commission. Lecturer on the Sanitary Features of the Chicago Drainage Canal. Chicago, Ill.

FRANK KEMPSMITH, Superintendent of Tool Shops. Lecturer on the Milling Machine. Milwaukee, Wis.

LEONOR F. LOREE, Superintendent of the Cleveland and Pittsburg Division of the Pennsylvania Railway System. Lecturer on Track. Cleveland, Ohio.

DANIEL W. MEAD, B.C.E., Consulting Engineer. Lecturer on the Water Supplies of Southern Wisconsin and Northern Illinois. Rockford, Ill.

EDWARD F NEUKOM, M.E., Designing Engineer with E. P. Allis & Co. Lecturer on Modern Deep Mine Hoisting Engines. Milwaukee, Wis.

CORYDON T. PURDY, C.E., Consulting Engineer. Lecturer on Iron and Steel Tall Building Construction. Chicago, Ill.

AUGUSTUS J. ROGERS, PH.D. Lecturer on Electrolysis. Milwaukee, Wis.

JAMES W. SEE, Consulting Engineer. Lecturer on Patents and Mechanism. Hamilton, Ohio.

JOHN F. WALLACE, C.E. Chief Engineer of the Illinois Central R. R. Lecturer on Recent Improvements on the Illinois Central at Chicago. Chicago, Ill.

GILBERT WILKES, PH.D., Chief Engineer of the Detroit Electrical Works. Lecturer on Dynamo Designing. Detroit, Mich.

ORGANIZATION OF THE COLLEGE.

The College of Engineering is organized in the belief that thorough-going fundamental training is the first essential to a successful engineer, but that this fundamental training may be best secured in connection with a certain amount of study of the practical applications of the principles involved, and not solely by theoretical study. It is further a leading thought that after the fundamental principles have been mastered, a certain measure of specialization in the leading lines of engineering is advisable, because of the great development of engineering in recent years and the various phases which it is rapidly assuming. It is the endeavor of this institution to combine a prudent amount of specialization in the closing years with a thorough grounding in the fundamentals in the earlier portion of its courses; and in carrying this out, it endeavors to make the mathematical and theoretical courses strong in the earlier years, and the applied courses strong in the later years, while the draughting and shop courses continue progressively from the beginning to the end. It also introduces sufficient foreign language to enable its graduates to read the professional German or French literature, and also to give so much of the mastery of the English language as to enable its graduates to present professional subjects with ease, clearness, and effectiveness.

Especial encouragement is given to those who can afford the time to graduate in a collegiate course before entering the course in Engineering. By electing the mathematics required of Engineers during the collegiate course, the degree in engineering can be obtained in two additional years. Greater satisfaction and profit is gained from the study of engineering when the student has already acquired a broad and thorough general training. Engineers are often called upon to fill the highest positions in the community, demanding breadth of view and wide general training. The opportunities for acquiring this breadth of education, as

it is given by a complete collegiate course, are few after the student has begun the active practice of his profession.

The College of Mechanics and Engineering offers three systematic courses, as follows:

One in CIVIL ENGINEERING.

One in MECHANICAL ENGINEERING.

One in ELECTRICAL ENGINEERING.

To those students who desire a course in METALLURGICAL ENGINEERING, elections are offered for advanced work in geology, mineralogy, commercial assaying, and chemistry, and the general engineering courses in metallurgy, treatment of ores, and electro-metallurgy.

REQUIREMENTS FOR ADMISSION.

There are three methods of admission to the University:

I. By examination at the University.

II. By special local examinations.

III. By certificates from accredited schools.

I. Examinations at the University.

The regular examinations of the University are two in number; one in June and one in September. For the current year the earlier examinations will be held on Thursday and Friday, June 14 and 15, beginning at 9 A. M. The later examinations will be held on Tuesday and Wednesday, September 11 and 12, beginning at 9 A. M. Examinations will also be held on the opening day of the winter and spring terms. Candidates must be present at the first examination of the first day. The examinations for admission to the Freshman class in any of the engineering courses, will cover the following subjects:

Geography, political and physical.

History of the United States: Montgomery's or Johnson's History of the United States.

Arithmetic.

Algebra: through quadratic equations, theory of indices and radicals; as much as is contained in the corresponding parts of Van Velzer and Slichter's School Algebra, Wentworth's School Algebra or Elements of Algebra, Hall and Knight's Elementary Algebra, C. Smith's Elementary Algebra, Todhunter's Algebra for Beginners, Wells' Elementary Algebra, or Sheldon's Elementary Algebra.

Geometry, Wentworth's, plane, solid, and spherical.

English. 1. An analysis of short extracts from prose and poetry, as to forms and meaning of words, structure of sentences, paragraphing and figures of speech.

2. Each candidate will be required to write a short essay on a subject to be announced at the time of the examination. The essay will be taken as a test of a candidate's knowledge of spelling, punctuation, use of capital letters, grammar, structure of sentences, and paragraphs.

German: Correct pronunciation, the essentials of grammar (Collar-Eysenbach's, Joynes-Meissner's, Whitney's, etc.), and the ability to apply them (two terms' work); acquisition of a vocabulary sufficient to enable students to read and translate sixty reading lessons in any standard reader correctly and understandingly; practice in the oral use of German in connection with the reading lessons, and the memorizing of from 9 to 12 German poems (two terms' work), and the careful study of at least two plays, as Minna von Barnhelm, Der Neffe als Onkel, Die Journalisten, etc. (two terms' work).

French: Instead of German, an equivalent amount of French may be offered.

Physics: Gage or Avery, with laboratory work.

Physiology: Martin's The Human Body (briefer course).

Botany: Gray's Lessons, with plant analysis and description.

Adaptive work: amounting to one daily recitation for two years. This may consist of various subjects. The University advises:

1. Two years' daily work in French or Latin; or,
2. One year's work in history and one year's work in English literature. If these studies cannot be taken, a selection from the following studies may be offered:
3. Rhetoric, civil government, mental science, theory and art of teaching, zoology, astronomy, or other science. No subject can be offered which has been pursued in high school for a shorter time than twelve weeks, or which is less in amount than a standard high school text-book on the subject. The total amount offered must be the equivalent of a daily recitation for two years. The two years' work may be made up of these studies in any combinations, under the conditions stated above.

Real equivalents will be accepted for the requirements given above. Students desiring admission into any course must present those requirements which are essential to the work of the course.

Conditions in entrance examinations will be limited to those cases in which the Board of Examiners think that the maturity and strength of the student will allow him to carry the regular work of his course and make up the conditions.

Admission of Special Students.

Candidates under twenty-one years of age desiring to take special courses will be required to present the same qualifications as candidates for one of the regular courses of the University.

Persons twenty-one years of age, who are not candidates for a degree, and who wish to take special studies, will be permitted to do so upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree, or to take a regular course, they must pass the required entrance examinations.

II. Admission by Special Local Examinations.

To save expense and embarrassment to those who live at a considerable distance from the University, special local examinations will be given when satisfactory arragements can be made.

III. Admission upon Certificates.

Graduates of schools which have been accredited to the University for the General Science and Engineering courses, will be admitted to any one of the Engineering courses upon presentation of a certificate from the principal of the school.

DEGREES.

The University confers upon the graduates in the Engineering courses the degrees of Bachelor of Science in Civil, Mechanical, or Electrical Engineering.

The degrees of Civil Engineer, Mechanical Engineer, and Electrical Engineer are conferred as second degrees upon Bachelors of Science in the Civil, Mechanical, and Electrical Engineering courses respectively, (1) who pursue advanced professional study at the University for one year, and present a satisfactory project or thesis; or (2) who present suitable evidence of three years of professional work, of which one must be in a position of responsibility, and a satisfactory thesis.

University Fellowships.

For the purpose of promoting higher scholarship and more extended original study than the academic courses afford, the Board of Regents has established eight University Fellowships of $400 each, conditioned upon proper qualifications and upon a prescribed amount of instruction rendered in the University.

QUARTERS AND EQUIPMENT.

Much of the laboratory, draughting, experimental, and class work of the College of Mechanics and Engineering is provided for upon the two lower floors of Science Hall, one of the best educational structures in this country. Shop work and additional laboratory work is carried on in a well equipped building exclusively devoted to the purpose, which, through the generosity of the legislature of 1893, is to be largely extended; the chemistry, assaying and metallurgical work are carried on in the Chemical Building, a fine structure built especially for the purpose. The work in physics, mineralogy, geology, etc., is carried on in other parts of Science Hall; the practical astronomy at the Students' Observatory; the language and mathematical studies in the literary halls of the University. The advantages of association with students seeking general and literary culture are thus secured. All laboratories and courses of study in the University are open to the students in engineering for elective work.

Libraries.

The library facilities of the University are very great. Besides the University library containing more than 30,000 volumes, of which a good share are books pertaining to the engineering profession, there are the library of the State Historical Society (150,000 volumes) and the City free library (13,000 volumes) to which the students have free access. The College of Mechanics and Engineering subscribes for more than fifty technical periodicals, and these are kept in the engineering reading room in Science Hall in order to facilitate the frequent use of them by the engineering students. The files of technical periodicals in the library are unusually complete, and additions are made every year.

Laboratories.

The engineering laboratories are well equipped for purposes of instruction and investigation.

In the Testing Laboratory are Olson, Thurston, and Riehle machines for making tests in tension, compression, bending, and torsion, also for making tests of cements. These machines are supplied with extensometers, clamps, devices for autographic records, and other special devices. Two lathes (in addition to those in the machine shop) are placed in the laboratory for convenience in preparing specimens for the testing machines.

The Hydraulic Laboratory contains high and low level tanks

fitted for experimenting upon the flow of water through orifices, nozzles, pipes, and over weirs. In the laboratory are several water motors, water meters, current meters, etc., all available for experimental work. There is also a convenient supply of gauges and other apparatus required in accurate hydraulic experiment.

The Steam Engineering Laboratory contains a hot-air engine, a gas engine, and several steam-engines of various types. The most important experimental engine is a fifty horse power quarter-crank compound engine, so arranged that either cylinder can be supplied with live steam from the boilers and run as a single cylinder engine. The condenser and pumps can also be disconnected so that the engine may be run as a non-condensing one. Both cylinders and the receiver are provided with steam jackets, which may be used at will. By means of a Proell governor, the number of revolutions may be varied from 50 to 125. The cylinders each have four poppet valves, and the cut-off of the steam is automatically controlled by the governor and may vary between zero and nine tenths of the stroke. A new fifty horse power Root boiler furnishes the steam for this engine exclusively. The laboratory is supplied with friction brakes, transmitting dynamometers, mercury column, and other means for testing steam, water, vacuum, and other gauges, and various devices for special tests. there are also the necessary tanks, weighing apparatus, pyrometers, calorimeters, indicators, etc., for making complete tests of the economy and capacity of boilers; with a variety of minor and accessory apparatus. The laboratory contains a large model of Stephenson's link motion, in connection with the piston, cross-head, connecting-rod, and crank of engine.

For elementary instruction in the Electrical Laboratory, the electrical apparatus of the Physics Department is available. The electrical laboratory is also well supplied with exact scientific and commercial instruments, and is arranged for instruction and investigation. With the additional space and apparatus which is allowed through the generosity of the last legislature, the equipment will be made unusually complete in the lines of continuous current, and single and multiphase alternating current generation and distribution, and commercial electro-chemistry. The dynamos in the laboratory are to be arranged in a large special room, with a special engine of exceedingly close speed regulation. For use in testing dynamos, a Brackett cradle dynamometer and other necessary apparatus is at hand. A photometer room is well arranged for the commercial comparisons of arc and incandescent lamps, or for scientific investigations.

The Assay Laboratory, situated in the south part of the basement of the Chemical Laboratory, is one of the largest and best equipped laboratories of its kind in the country. It has separate rooms for furnaces, tables, wet assaying, and balances. The furnace room is supplied with eleven crucible and three muffle furnaces, as well as a small gas plant. It has steam power, a Sturtevant blower, bullion rolls, a Blake ore crusher, and other pulverizers. The table room has space for twenty-four students, and is well supplied with ordinary balances. In the balance room are first-class quantitative balances by Becker and an Oertling gold balance.

The Machine Shop affords excellent facilities for mechanical practice. It embraces a main machine room properly equipped; a room containing smaller machines; a carpenter shop supplied with wood-working machines; a forge room, provided with forges and their equipment, with blast and exhaust fans; a foundry room whose equipment consists of a cupola, brass furnace, and core oven, with the necessary small tools; a wood-work room supplied with benches, carpenter tools, and wood-turning lathes; and a pattern room furnished with the requisite tools. The shop is supplied with convenient lockers, closets, and washroom with hot and cold water. The space and equipment of the shop will be considerably increased by the beginning of the next college year, to provide for the rapid increase in the number of students entering the classes of the Engineering school.

The Engineering Museum contains a complete set of Schroeder's models for descriptive geometry, including shades, shadows, and perspective; also a small collection of Schroeder's kinematic models, besides a number of smaller models, made by students, illustrating problems in kinematics.

The draughting rooms contain a large and varied collection of general working and detailed drawings illustrating a great variety of engineering structures and machines.

The surveying instruments include six transits and theodolites, with several solar attachments; five engineer's wye and dumpy levels; and sextants, compasses, aneroids, chains, steel tapes, leveling rods of various patterns, and all needful accessories.

The standards of weights and measures belonging to the State are kept in the laboratories, and all official comparisons are made here.

EXPENSES.

Tuition for residents of the State of Wisconsin,	FREE.
Tuition for non-resident students — per term,	$6.00
General fee — first term,	5.00
General fee — second term,	5.00
General fee — third term,	2.00
Engineering periodical fee for the year,	1.50

A laboratory fee of $1.00 per term for each 2 hours' work per week is charged in all engineering laboratories.

Students working in any of the other laboratories of the University are also required to pay a fee or to make a deposit to cover the cost of the materials and repairs of instruments used by them.

Rooms, furnished and unfurnished, can be obtained in the city at reasonable rates. The cost of board in clubs is from $2.00 to $3.50 per week; in private families from $2.50 to $4.00 per week.

COURSES OF STUDY.

CIVIL ENGINEERING COURSE.

Freshman Year.

FALL TERM.—French, 4,† (5),‡ or German, 9(a), (5); Rhetoric, 1(a), (3); Mathematics, 1, (5); Topographical Engineering, 1, (Civil Eng.), (5), or Machine Design, 1, (Mech. and Elect. Eng.) (5); Shop Work, 1, (2½).

WINTER TERM.—French, 4, (5), or German, 9(a), (5); Rhetoric, 1(b), (3); Mathematics, 2, 3, (5); Mathematics, 8, (5); Shop Work, 2, (Mech. and Elect. Eng.), or 8, (Civil Eng.), (2½).

SPRING TERM.—French, 4, (5), or German, 9(a), (5); Rhetoric, 1(c), (3); Mathematics, 4, (5); Mathematics, 8, (5); Shop Work, 3, (2½); Military Drill from September 21 to May 15.

Sophomore Year.

FALL TERM.—Mathematics, 4, 5, (5); Physics, 2, 3b, (5); Chemistry, 1, (5); Mineralogy, (4); Topographical Engineering, 2, (2).

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*Engineering students are advised to attend the synoptical lecture courses of the College of Letters and Science whenever such attendance will not interfere with their prescribed work.

†The language of the Freshman year must be the same as that offered for the entrance examination.

‡The figure in parentheses denotes the number of hours per week. For descriptions of the various courses see pp. 118-141.

WINTER TERM.—Mathematics, 5, (5); Physics, 2, 3b, (5); Chemistry, 1, (5); Mechanics, 1a, (5).

SPRING TERM.—Mathematics, 5, 6, (5); Physics, 2, 3b, (4); Mechanics, 1a, (5); Topographical Engineering, 3, (7); Military Drill from November 1 to May 15.

Junior Year.

FALL TERM.—Mechanics, 1b, 2, (7); Machine Design, 3, (3); Structural Engineering, 1, 2a, (4); Railway Engineering, 1, 2, (7).

WINTER TERM.—Mechanics, 3, (4); Railway Engineering, 3, (2); Steam Engineering, 5, (3); Structural Engineering, 2b, 3, 4, (7); Topographical Engineering, 4, (2); Mineralogy, (2).

SPRING TERM.—Mechanics, 1c, (5); Structural Engineering, 5a, 7a, (8); Steam Engineering, 6, (3); Astronomy, 5, (5); Topographical Engineering, 5, two weeks.

Senior Year.

FALL TERM.—Structural Engineering, 5b, 6 7b, (10); Railway Engineering, 5, (3); Hydraulic and Sanitary Engineering, 1a, (3); Geology, 1, (5).

WINTER TERM.—Railway Engineering, 4, (3); Structural Engineering, 7c, (4); Hydraulic and Sanitary Engineering, 1b, 3b, (5); Highways and Canals, 2, (2); Astronomy, 6, (2); Laws of Corporations and Contracts, (2); Thesis (2).

SPRING TERM.—Railway Engineering, 6, (4); Structural Engineering, 8, (2); Hydraulic and Sanitary Engineering, 1c, (2); Highways and Canals, 1, (2); Geology, 5, (5); Thesis, (5); Topographical Engineering, 5, two weeks.

Graduate Courses.

For graduate students and students desiring to specialize, opportunity is offered for advanced study in railway, structural, or sanitary designs, and for special laboratory investigations.

MECHANICAL ENGINEERING COURSE.

Freshman Year.

The same as the Civil Engineering Course.

Sophomore Year.

FALL TERM.—Mathematics, 4, 5, (5); Physics, 2, 3b, (5); Chemistry, 1, (5); Machine Design, 2, (2); Shop Work, 4, 5, (4).

WINTER TERM.— Mathematics, 5, (5); Mechanics, 1a, (5); Physics, 2, 3b, (5); Chemistry, 1, (3); Machine Design, 2, (3).

SPRING TERM.—Mathematics, 5, 7, (5); Mechanics, 1a, (5); Physics, 2, 3b, (4); Chemistry, 1, (2); Machine Design, 2, (5).

Military drill from November 1 to May 15.

Junior Year.

FALL TERM.—Mechanics, 1b, 2, (7); Electrical Engineering, 1, (5); Machine Design, 2, 4, (5); Shop Work, 6, (4).

WINTER TERM.—Steam Engineering, 1, (5); Electrical Engineering, 1, (4); Machine Design, 5, (7); Shop Work, 8, (5).

SPRING TERM.—Steam Engineering, 2, 4, (9); Machine Design, 5, 6, (7); Shop Work, 9, (5).

Senior Year.

FALL TERM.—Steam Engineering, 3, 4, (10); Machine Design, 6a, (8); Shop Work, 10, (3).

WINTER TERM.—Steam Engineering, 3, 4, (6); Machine Design, 6a, (5); Laws of Corporations and Contracts, (2); Shop Work, 11, (3); Thesis, (5).

SPRING TERM.—Hydraulic Engineering, 2, 3a, (6); Shop Work, (5); Thesis, (10).

Graduate Courses.

Graduate students will be received in the Department of Mechanical Engineering, and opportunity for advanced study in Machine Design and Steam Engineering will be given by the professors in charge.

ELECTRICAL ENGINEERING COURSE.

Freshman Year.

The same as the Civil Engineering Course.

Sophomore Year.

FALL TERM.—Mathematics, 4, 5, (5); Physics, 2, 3a, (4); Chemistry, 1, (5); Machine Design, 2, (2); Shop Work, 4, 5, (5).

WINTER TERM.—Mathematics, 5, (5); Mechanics, 1a, (5); Physics, 2, 3a, (4); Chemistry, 1 (5); Machine Design, 2 (2).

SPRING TERM.—Mathematics, 5, 7, (5); Mechanics, 1a, (5); Physics, 2, 3a, (4); Chemistry, 1, (2); Machine Design, 2, (5).

Military drill from Nov. 1 to May 15.

Junior Year.

FALL TERM.—Mechanics, 1b, (5); Physics, 5, (2); Electrical Engineering, 1, (5); Machine Design, 3, 4, (5); Shop work, 6, (4).

WINTER TERM.—Mechanics, 2, (2); Physics, 6, (3); Steam Engi-

neering, 5, (3); Electrical Engineering, 1, (5); Machine Design, 5, (7); Shop Work, 8, (2).

SPRING TERM.— Steam Engineering, 4, 5, (5); Electrical Engineering, 2a, (6); Machine Design, 5, 6, (7); Shop Work, 7, (3).

Senior Year.

FALL TERM.— Steam Engineering, 3, 4, (5); Electrical Engineering 2b, 4, 6a, (11); or 4, 7a, (10); Machine Design, 7b, (5).

WINTER TERM.— Electrical Engineering, 3, 4, 6b, (11); or 4, 7b, (10); Machine Design, 7b, (5); Laws of Corporations and Contracts, (2); Thesis.

SPRING TERM.—Hydraulic Engineering, 2, 3a, (6); Electrical Engineering, 5, 6c, or 5, 7b, (10); Thesis.

Graduate Courses.

Graduates and advance students are offered instruction in advanced design and experimental investigations relating to Electrical Engineering.

ELECTIONS FOR STUDENTS IN GENERAL UNIVERSITY COURSES.

Students who plan to graduate in engineering, after taking a degree in any other college of the University, should aim to make the following elections during their undergraduate course, in order that the engineering course may be completed in two additional years:

Freshman Year.

Mathematics, all courses; Topographical Engineering, 1, or Machine Design, 1.

Sophomore Year.

Mathematics, all courses; Physics, 2 and 3b; Topographical Engineering, 2 and 3, or Machine Design, 2, 3 and 4; Pure and Applied Mechanics, 1a and 2.

Graduates in any of the Engineering courses may graduate in any other Engineering course after one year of additional study. Students who contemplate doing this should, however, make their elections, especially in the Senior year, with this end in view.

DEPARTMENTS OF INSTRUCTION.

The number of hours given is the actual number of hours of instruction. Class-room work and lectures require outside preparation, draughting room and laboratory work do not.

FRENCH.

PROFESSOR OWEN.

1. Elementary Course. Otto's French Conversation Grammar, Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the class room). Additional material for translation will be assigned as the progress of the class allows. *Throughout the year; M., Tu., W., Th., F., at* 11. Miss GAY.

   As many students desire a reading knowledge only, the effort of the above is concentrated upon reading. Students are expected, at the end of the course, to read with sufficient ease and accuracy to make a practical use of French text-books in the prosecution of their other studies.

4. Composition, etc. Written translation into French of the English exercises in Otto's Grammar, oral translation into French of Howard's Aids to French Composition, lectures in French on the history of the language and recitations in French on the same, lectures in French on the early literature of the language, recitations in French from Demogeot's History of French Literature, reading independently for examination an abridgement of Les Trois Mousquetaires of Dumas and other easy French to be assigned. *Throughout the year; M., Tu., W., Th., F., at* 8. Given in in 1894–95.

5. Advanced Reading and Syntax. Reading in class parts of Cinq-Mars, Ursule Mirouet, Travailleurs de la Mer, La Fontaine's Fables, etc., reading independently for examination the Histoire de Charles XII. and other easy French to be assigned. *Throughout the year; M., Tu., W.. Th., F., at* 8. Given in 1893–94.

   Required of those Freshmen who do not elect German.

GERMAN.

PROFESSOR ROSENSTENGEL AND MISS STERLING.

Engineering Courses. The aim is to impart a reading knowledge of scientific German, thus enabling the students to read German scientific works in connection with their special line of study.

9. (a) Gore's German Science Reader, Rosenthal's Elektrische Erscheinungen, Siemen's Elektrische Telegraphie, and other monographs from the "Sammlung gemeinverständlicher wissenschaftlicher Vorträge." *Throughout the year; M., Tu., W., Th., F., at* 11. Miss STERLING.

Required of those Freshmen in the Engineering Courses who do not take French.

10. (a) German Monographs on Engineering Subjects. Elective for Sophomore Engineers, but required of those who have not, during their Freshman year, gained a reading knowledge of scientific German satisfactory to the instructor. *Throughout the year; M., W., F., at* 12. Miss STERLING.

RHETORIC AND ORATORY.

ASSISTANT PROFESSOR KNOWLTON AND MR. SAUNDERSON.

1. (a) Genung's Outlines of Rhetoric; exercises in composition with criticism of the same before the class. *Fall term; M., W., F., at* 12. Assistant Professor KNOWLTON.

(b) Paragraph-formation. Reading and criticism of short masterpieces illustrative of leading literary types. Four themes embodying the principles of Description, Narration, Exposition and Argumentation. *Winter term; M., W., F., at* 12. Assistant Professor KNOWLTON.

(c) Spencer's Philosophy of Style. Composition at sight. Practical exercises in describing Engineering Structures and Machines. *Spring term; M., W., F , at* 12. Assistant Professor KNOWLTON.

Required of Freshmen in Engineering.

2. A special course will be offered to students who have completed the required work in Rhetoric. This course, which is designed to be purely practical in its application, is to aid the student clearly to express his views on scientific

and technical questions that may face him in the actual practice of his profession. *Throughout the year; once a week.* Assistant Professor KNOWLTON.
Elective for Engineers.

3. Elocution. Voice training, and plain reading and speaking of the kind most needed by business and professional men. Lectures upon the use and care of the voice, and upon the principles of effective reading and speaking. *Winter term, three times a week.* Mr. SAUNDERSON.
Elective for Engineers.

MATHEMATICS.

PROFESSOR SLICHTER, ASSISTANT PROFESSOR RICHTER, MR. SKINNER, MR. MACK AND MR. SMITH.

1. Algebra. The course includes progression, arrangements and groups, binomial theorem, the theory of limits, undetermined coefficients, series, and logarithms. Text-book: Van Velzer and Slichter's University Algebra. *Fall term; M., Tu., W., Th., F., at* 10 (70 *hours in class room*). Professor SLICHTER and Mr. SKINNER.
Required of Freshmen in Engineering.

2. Algebra. Imaginaries, rational integral functions of one variable, and solution of numerical equations of higher degrees. Text-book: Van Velzer and Slichter's University Algebra. *Winter term; Tu., Th., at* 10 (24 *hours in class-room*). Professor SLICHTER and Mr. SKINNER.
Required of Freshmen in Engineering.

3. Plane Trigonometry. In this course the ratio system is exclusively used. Text-book: Van Velzer and Slichter's Trigonometry and Tables. *Winter term; M., W., F., at* 10 (36 *hours*). Professor SLICHTER and Mr. SKINNER.
Required of Freshmen in Engineering.

4. Analytic Geometry. Straight line and conic sections, general equation of the second degree, and introduction to geometry of three dimensions. *Spring term; M., Tu., W., Th., F., at* 10; *fall term; Tu., Th., at* 8 (78 *hours in class room*). Professor SLICHTER and Mr. SKINNER.
Required of Freshmen and Sophomores in Engineering.

5. Calculus. *Fall term; M., W., F., at* 8: *winter term; M., Tu., W., Th., F., at* 4; *spring term; Tu., Th., at* 12. (122 *hours in class-room*). Professor SLICHTER.

Required of Sophomores in Engineering.

6. Spherical Trigonometry. The fundamental formulas are derived by the transformation of coördinates. *Spring term; M., W., F., at* 11 (30 *hours in class-room*). Professor SLICHTER.

Required of Sophomores in Civil Engineering.

7. Differential Equations. *Spring term; M., W., F., at* 8 and 9 (30 hours in class-room). Professor SLICHTER.

Required of Sophomores in Mechanical and Electrical Engineering.

8. Descriptive Geometry. Projection of lines, planes, surfaces, and solids; intersections; tangents to curves and surfaces; problems in warped surfaces; shades and shadows; linear perspective and isometric projection. The class-room exercises are accompanied by work in the draughting-room. Text books: Watson's Descriptive Geometry for the Mechanical and Electrical Engineering courses, and Church's Descriptive Geometry for the Civil Engineering course. *Winter and spring terms*; *M., Tu., W., Th., F.*, 8-10; *Tu., Th.*, 2-4 (66 *hours in the class-room and* 88 *in draughting-room*). Assistant Professor RICHTER, Mr. MACK and Mr. SMITH.

Required of Freshmen in Engineering.

PHYSICS.

PROFESSOR SNOW AND DR. AUSTIN.

2. General Lectures. *Throughout the year; M., W., at* 12. *Also one recitation, F. or S., hours to be assigned.* Professor SNOW.

Required of Sophomores in Engineering.

3*a*. Introductory Physical Laboratory Practice for Electrical Engineers. *Throughout the year; fall term, Tu.*, 3-5; *winter term, afternoon, hours to be assigned; spring term, F.*, 2-4. Dr. AUSTIN.

3*b*. Introductory Physical Laboratory Practice for Civil and Mechanical Engineers. *Fall term; M.*, 4–6, *Th.*, 3-5; *winter term, Tu.*, *Th.*, 2-4; *spring term, Tu.*, 2–4. Dr. AUSTIN.

The Introductory Physical Laboratory is open daily, except Saturday, in the afternoon. Students may therefore make other arrangements to time, if more convenient.

5. Precision of Measurements. A laboratory course in Electrical and Magnetic Measurements. *Fall term; W., F.*, 2–4 (56 *hours in laboratory*). Professor SNOW.

Required of Juniors in Electrical Engineering.

6. Advanced Electrical Measurements. Testing and calibration of electrical instruments, and determination of constants. *Winter term; M., F.*, 2–5 (72 *hours in laboratory*). Professor SNOW.

Required of Juniors in Electrical Engineering.

ASTRONOMY.

PROFESSOR COMSTOCK.

5. Astronomical Practice. This course gives training in the theory and use of instruments of precision, and teaches the more important practical applications of astronomy, such as the determination of time, latitude, longitude, and the direction of the meridian. Attention is paid to methods of computation and the numerical treatment of observed data. *Spring term; M., Tu., W., Th., F.*, 2–4 (100 *hours in observatory*.)

Required of Juniors in Civil Engineering.

6. Method of Least Squares. The subject is treated from the empirical side, and stress is laid upon the application of principles rather than upon the purely mathematical problems which accompany them. *Winter term; Tu., Th., at* 11 (24 *hours in class-room*).

Required of Seniors in Civil Engineering.

CHEMISTRY.

PROFESSOR DANIELLS AND ASSISTANT PROFESSOR HILLYER.

1. *Fall term: M., W.. F.*, 2–4, *Tu., Th.*, 2–3, *F.*, 10–12; *winter term: M., W., F.*, 2–4, *Tu., Th.*, 10–12; *spring term: M., W.*, 2-4, divided as follows:

a. Descriptive Inorganic Chemistry, lectures and laboratory practice for fourteen weeks. Professor DANIELLS.

b. Qualitative Analysis, for eight weeks. Assistant Professor HILLYER.

c. Quantitative Work in the determination of the equivalence of elements, for four weeks. Professor DANIELLS.

d. Descriptive Organic Chemistry, Gas Analysis, or Sanitary Water Analysis, lectures and laboratory practice for ten weeks. Professor DANIELLS and Assistant Professor HILLYER (270 *hours in lectures and laboratory*).

Required of Sophomores in Engineering.

MINERALOGY.

ASSISTANT PROFESSOR HOBBS.

Short Course in Mineralogy. General mineralogy is treated during the fall term and blowpipe analysis during the winter term.

Required of all civil engineers. *Fall term; M., Tu., W., Th., at* 9; *winter term; M., W.*, 2–4.

GEOLOGY.

PROFESSOR VAN HISE.

1. General Geology. The geological forces and the work they accomplish; the geography of the continents; the effects of land relief, water areas and rivers upon the distribution of peoples; rocks and their original and secondary structures; a series of synoptic lectures on historical geology. Required of Seniors in civil engineering. *Fall term; M. Tu., W., Th., F., at* 12. Text-book, Geikie's Class Book of Geology.

[Not required in the year 1894-95.]

5. Applied Geology. Treats of the geology of potable water, structural materials, soils, mineral fuels, nd ore deposits. A report upon an assigned topic is required of each student. Must be preceded by Course 1. *Spring term; M., Tu , W., Th., F., at* 10.

Required of Seniors in Civil Engineering.

PURE AND APPLIED MECHANICS.

ASSISTANT PROFESSOR MAURER AND MR. SMITH.

1. Mechanics. This course is shaped with special reference to the practical requirements of engineers.

   (a) Mechanics of Solids. Two terms are devoted to this part of the course. During the winter term the work covers the main principles of the subject of statics, centre of gravity, friction, and simple machines. During the spring term the work deals mainly with kinematics and kinetics, the principles of work and energy, and moments of inertia. *Winter and spring terms; M. Tu., W., Th., F., at 8 and 9* (110 *hours in class room*). Assistant Professor MAURER and Mr. SMITH.

   Required of Sophomores in Engineering.

   (b) Mechanics of Materials (elastic solids). The strength and elastic properties of the most important materials of construction are studied from a theoretical standpoint. *Fall term; M., Tu., W., Th., F., at 9 and 11* (70 *hours in class room*). Assistant Professor MAURER.

   Required of Juniors in Engineering.

   (c) Mechanics of Fluids. Only enough time is devoted to theoretical hydromechanics to enable the student to pass on to the practical considerations of the flow of water through orifices, in conduits, canals, and rivers; water power, hydraulic motors, etc. *Spring term; M., Tu., W., Th., F., at 10* (40 *hours in class-room*). Assistant Professor MAURER.

   Required of Juniors in Civil Engineering.

   Required of Seniors as a four-fifths study in the fall term, 1894–95. *M., Tu., W., Th., at 10.*

2. Testing Materials. Each student is required to make a definite series of tests of wrought iron, cast iron, steel and wood in tension, compression, bending, and torsion. *Fall term; M., W., 8–10; M., 2–6; Tu., Th., 2–6,* (56 *hours in laboratory*) for Juniors in Civil and Mechanical Engineering. *Winter term; Tu., Th., 11–1; W., 2–6* (44 *hours in laboratory*) for Juniors in Electrical Engineering. Assistant Professor MAURER.

3. Graphic Statics. This course covers the following general subjects: (1) General theory of graphic statics, being a development from first principles, by graphic methods, of the general principles of the statics of coplanar forces, and of the composition and resolution of forces. (2) Applications to the determination of stresses in framed structures under fixed loads. (3) Applications to the determination of the centre of gravity and moment of inertia of any plane area. The work consists of recitations and draughting. As part of the draughting, the student is required to make, graphically, the computations which form the basis of problems in roof design, to be completed the following term. *Winter term; M., W., F., at* 11; *M., Tu., W., Th., F., at* 12 (*including the draughting*). Assistant Professor MAURER.

Required of Juniors in Civil Engineering.

TOPOGRAPHICAL ENGINEERING.

PROFESSOR WHITNEY AND MR. SMITH.

1. Elementary Drawing. Instruction is given in lettering, pen topography, colored topography, and brush shading. The conventional signs used in the various kinds of map drawing are carefully studied. The course is preparatory for work in railway and topographical engineering. *Fall term; M., Tu., W., Th., F.*, 8–10 (140 *hours in draughting room*). Mr. SMITH.

Required of Freshmen in Civil Engineering.

2. Elementary Surveying. The principles of the instrumental adjustments are first studied; after which practical problems in land surveying and profile leveling are worked. Taught partly in lecture room, drawing room, and in the field. *Fall term; Tu., Th.*, 10–12. Professor WHITNEY and Mr. SMITH.

Required of Sophomores in Civil Engineering.

3. Advanced Surveying. This study includes the theory and practice of city, mining, hydrographic, and stadia surveying. Text-book: Johnson's Surveying. *Spring term; M., W., at* 10 (20 *hours*). *Five times a week in the field* (100 *hours*); *W.*, 2-4; *F.*, 2-6; *S.*, 8–12. Professor WHITNEY and Mr. SMITH.

Required of Sophomores in Civil Engineering.

4. Geodesy. This course includes the theory of geodetic measurements, method of computation, and a study of U. S. Coast Survey charts and reports. *Winter term; Tu., Th., at* 10 (24 *hours in class-room*). Professor WHITNEY.

Required of Juniors in Civil Engineering.

5. Trigonometrical Survey. This includes the triangulation of the neighboring lakes with complete topographical and hydrographical surveys of the region. Begins the third Monday preceding Commencement and continues for two weeks (120 *hours*). Professor WHITNEY, Professor TURNEAURE, and Mr. SMITH.

Required of Juniors and Seniors in Civil Engineering.

RAILWAY ENGINEERING.

PROFESSOR WHITNEY.

1. Railway Surveying. A preliminary line about three miles in length is laid out, topography taken adjacent thereto, and platted. Each member of the class, given certain limits as to grades and curves, makes an independent projection for final location. Approximate estimates of the cost are made, and the best line is located on the ground. All necessary field and office work required to survey and construct such a line is performed. *Fall term; W.*, 2–4; *F.*, 2–6; *S.*, 8–12. (140 *hours field and office work.*)

Required of Juniors in Civil Engineering.

2. Location and Construction. This course is class-room work to be accompanied by Course 1. Lectures and recitations on preliminary and location surveys, and on construction, including rock-work, tunneling, explosives, etc. *Fall term; M., W., at* 10 (28 *hours in lecture-room*).

Required of Juniors in Civil Engineering.

3. Construction and Maintenance of Way. Lectures on dredging, docking, pile driving, track work in general, including street railway, freight and passenger yard construction, and standard structures. The various signal and interlocking systems are studied. *Winter term; T., Th., at* 11 (24 *hours in lecture-room*).

Required of Juniors in Civil Engineering.

4. Railway Economics. A study of the sources of income; operating expenses; relative values of distance, gradient, and curvature and their influence upon net receipts; classification of locomotives and their relative power; rolling stock; and train resistance. Text book: Wellington's Economic Theory of Railway Location. *Winter term; M., W., F.,* 11 (36 *hours in class-room*).

Required of Seniors in Civil Engineering.

5. Tunneling and Substructures. Latest methods of tunneling, shaft sinking, and deep foundation work. Designing retaining walls, piers, abutments, culverts, etc. *Fall term; M., W., F., at* 12 (42 *hours in lecture-room*).

Required of Seniors in Civil Engineering.

6. Railway Standards. This course is intended to give the student a working familiarity with designing various railway standards, such as: box and arch culverts, switches, frogs, freight and passenger yards, turn-tables, round-houses, freight and passenger stations, and the various minor buildings. It is carried on in the draughting-room, aided by careful study of numerous blue prints of the standards of the best existing railways. *Spring term; M., Tu., Th., F.,* 11–1 (64 *hours in draughting-room*).

Required of Seniors in Civil Engineering.

HIGHWAYS AND CANALS.

PROFESSOR WHITNEY.

1. Roads and Pavements. Lectures and assigned readings on the location, construction, and maintenance of country roads, and city streets and pavements. *Spring term; M., W., at* 9 (20 *hours in class room*).

Required of Seniors in Civil Engineering.

2. River and Harbor Improvement and Canal Construction. Lectures and assigned readings on the artificial improvement of rivers and harbors for navigation and protection, and on canal construction in the United States and abroad. *Winter term; Tu., Th., at* 12 (24 *hours in lecture room*).

Required of Seniors in Civil Engineering.

HYDRAULIC AND SANITARY ENGINEERING.

PROFESSOR TURNEAURE, PROFESSOR BULL AND ASSISTANT PROFESSOR RICHTER.

1. Water Supply and Sanitary Engineering. (a) Water supply Engineering. Collection, purification, and distribution of water. Interpretation of chemical and biological analysis. Given by lectures and assigned reading. *Fall term; Tu., Th., at* 12 ; *F., at* 10 (42 *hours in lecture-room*). Professor TURNEAURE.

   (b) Municipal and Sanitary Engineering. Sewerage systems, sewage and garbage disposal, and street cleaning. Lectures and assigned reading. *Winter term; M., W., F., at* 10 (36 *hours in lecture-room*). Professor TURNEAURE.

   (c) Designs of Water Supply and Sewerage Systems. *Spring term; Tu., Th.*, 8–10 (36 *hours in draughting-room*). Professor TURNEAURE.

   Required of Seniors in Civil Engineering.

2. Hydraulic Motors and Pumping Machinery. To prepare the student for the study of motors a short course in practical hydraulics is first given. The various experimental coefficients are discussed, as well as the ordinary methods for measuring the quantity of water used by any motor. Then the various motors are studied, especially turbine wheels, and the course concludes with a short study of pumping machinery. *Spring term; M., Tu., Th., F., at* 11 (40 *hours in class-room*) Professor BULL

   Required of Seniors in Mechanical and Electrical Engineering.

3. Hydraulic Laboratory. (a) In this course the student learns to measure the water consumed by a motor, to determine the experimental coefficients, and to measure the efficiency of small turbine wheels. *Last half of spring term; M., Tu., W., Th., F.*, 8–10 (50 *hours in laboratory*). Assistant Professor RICHTER.

   Required of Seniors in Mechanical and Electrical Engineering.

(b) This course teaches the student the use of standard forms of apparatus in measuring the flow of water through pipes, nozzles and orifices, and over weirs. Opportunity is also afforded for investigations of an original character. *Winter term; M., W.,* 2–4 (48 *hours in laboratory*). Professor TURNEAURE.

Required of Seniors in Civil Engineering.

STEAM ENGINEERING.

PROFESSOR BULL AND ASSISTANT PROFESSOR RICHTER.

1. Thermodynamics. This course covers those principles of the mechanical theory of heat which are preliminary to the study of the various kinds of heat-engines. The course is intended to be very thorough, especially with reference to steam. Text-book: Peabody's Thermodynamics of the Steam-Engine. The study is partly taught by lectures. *Winter term. M., Tu., W., Th., F., at* 11 (60 *hours in class-room*). Professor BULL.

Required of Juniors in Mechanical Engineering.

2. Theory of Heat-Engines and Boilers. In this study practical yet scientifically correct formulas for computing the diameter and stroke of the steam-engine are deduced. The influence of clearance, jacketing, cylinder condensation, wet and superheated steam are considered. The theory of compound, triple, and quadruple engines are given, as well as the results from practice in this direction. At the end of the course the subject of injectors, condensers, air and feed pumps are taken up. The general subject of combustion and its application to steam boilers is studied and the theoretical and practical efficiency of these is developed. The study is mostly given by lectures; for part of the work Peabody's Thermodynamics is used as a text-book. *Spring term; M., T., W., Th., F., at* 10 (50 *hours in class-room*). Professor BULL.

Required of Juniors in Mechanical Engineering.

3. Design of the Steam-Engine. In this course the diameter, stroke, and number of revolutions of the engine, as well as the steam pressure and cut-off, are assumed to be known, and from these data the other dimensions are

either computed or deduced according to practice. Special attention is given to the various kinds of valve gears, to the fly wheel, governor, and reciprocating parts, and their relations to each other. The study is taught principally by lectures, although Peabody's Valve Gears for Steam-Engines is used as a text-book for a part of the term. The work in the class-room is supplemented by the work in the draughting-room, where each student is required to work out a complete problem.

Class work. *Fall term; M. W., F., at* 12; *winter term; M. W., F., at* 9 (78 *hours*). Draughting; *fall term; T. W., Th., F.*, 10–12 (112 *hours*). Professor BULL.

Required of the Seniors in Mechanical Engineering, also three times a week in the fall term of the Seniors in Electrical Engineering.

4. Long Laboratory Course. For this study the compound experimental engine of the laboratory and the fifty-horse power Root boiler, besides the various other smaller engines and the gas and hot-air engines owned by the department, are used with all the necessary appliances for making complete tests of engines and boilers. Stress is laid upon the necessary calibration of all instruments used in the test, for which work the department has all the necessary appliances. Each student is required to perform all of the various operations necessary for conducting an accurate trial. The methods are first explained in a course of lectures during the spring term, *M., at* 9 (10 *hours*). Professor BULL. The laboratory work comes three times a week for the whole year (216 *hours*), beginning with the spring term. *Spring term; W., F.*, 8-10; *Tu.*, 2-4; *fall term; M., W.*, 2-4; *S.*, 9-11; *winter term; Tu., Th.*, 9-12. Assistant Professor RICHTER.

Required of Juniors and Seniors in Mechanical Engineering. Required of Juniors and Seniors in Electrical Engineering during spring term, *W., F.*, 2-4, and twice a week, *Tu., Th.*, 2-4, during the fall term.

5. Short Course in Thermodynamics and the Theory of the Steam Engine and Boiler. Only the fundamental principles of thermodynamics can be touched upon in this course, but to a sufficient degree to enable the student to study the steam engine and boiler intelligently. The theory of the steam engine is given to the exclusion of all other heat

engines. The text book used is Peabody's Thermodynamics, but a part of the study is given by lectures *Winter term: M., W., F., at* 10; *spring term, W., F., at* 9 (56 *hours in class-room*). Professor BULL.

Required of Juniors in Electrical Engineering; of Juniors in Civil Engineering for the winter term only.

6. Short Laboratory Course. This course is intended for Civil Engineering students and is more elementary than the long course in boiler and engine testing. The student will, however, learn enough to conduct an ordinary commercial test of a pumping engine. *Class work. M., at 9* (10 *hours*). Professor BULL. *Laboratory work* (40 *hours*), *spring term; W.*, 11–1, *and S.*, 8-10. Assistant Professor RICHTER.

ELECTRICAL ENGINEERING.

PROFESSOR JACKSON AND PROFESSOR DAVIES.

1. Electro-magnets and Dynamos. A discussion of the simple forms of electro-magnets; the development of the laws of magnetization by electric currents; the laws of simple magnetic circuits and the windings of electro-magnets; the relation between electro-motive force, velocity, and strength of field, under conditions obtaining in dynamos; the practical design of dynamos. The instruction is illustrated by the design, examination, operation, and testing of commercial dynamos in the drawing room and laboratory. Jackson's Text-book on Electro-magnetism and the Construction of Dynamos, Vol. 1. Must be preceded by Physics, 2. *Fall term; M., Tu., W., Th., F, at* 12; *winter term; M.*, 12; *Tu., Th.*, 2–4; *S.*, 9–1, (82 *hours in class-room and* 96 *hours in laboratory and draughting-room*). Professor JACKSON.

Required of Juniors in Electrical and Mechanical Engineering.

2. Applied Electro-chemistry.

(a) Primary and Secondary Batteries. Treats of electric batteries as sources of electricity; the construction of primary and secondary batteries; the chemical reactions occurring during their operation; and their commercial

use. Tests of various types of cells are made by the students in the laboratory. Text-books: Carhart's Primary Batteries, and Niblett's Secondary Batteries. *Spring term; six times a week* (40 *hours in class-room*); *M., T., W., Th.*, 10, *and* 40 *in laboratory Tu., Th.*, 2–4. Professor DAVIES.

Required of Juniors in Electrical Engineering.

(b)* Electrolysis and Electro-metallurgy. Consists of lectures on Faraday's law, electro-chemical equivalents, velocities of ions, relations between chemical affinites and electro-motive forces, electric osmosis, molecular conductivity, resistance of electrolytes, electrolysis of gases, atomic charges, Grotthuss' chains, effect of temperature on electrolysis, specific inductive capacity of electrolytes, etc. Electrolytic separation and refining of metals and treatment of ores are considered from the practical side. The instruction is illustrated by laboratory work. Text-book: Gore's Electrolytic Separation of Metals. Must be preceded by courses in chemistry and Course 2a. *Fall term*; *Tu., Th., at* 10 (28 *hours in class-room*) *and F.*, 2–4 (28 *hours in laboratory*). Professor DAVIES.

Required of Seniors in Electrical Engineering.

*3. Electric Circuits and Testing Lines used in Telephony, Telegraphy, and Railway Electric Signaling. Includes the construction of telephone and telegraph lines for local and long-distance circuits, and the selection of conductors, insulators, and supports; the protection of lines and plant from damage by lightning or by crossing with electric light and power wires, the effect of induction, leakage, and earth returns; the design and wiring of switch boards; the application of electric circuits and electro-magnetic mechanism to locking and operating railway signals. Taught by lectures. *Winter term; M., W., at* 9 (24 *hours in class-room*); *Tu., Th.*, 9–11 (48 *hours in laboratory*). Professor DAVIES.

Required of Seniors in Electrical Engineering.

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* Courses 2b, 3 and 6 are intended exclusively for students who expect to enter the field of practical electrical engineering and construction. The instruction is thoroughly practical. Students desiring to enter the field of teaching, or, for other reasons, desiring a further theoretical training, may substitute therefor the elective Course 7.

4. Theory and Application of Alternating Currents. Covers the theory of the generation and utilization of alternating electric currents; the design and construction of alternating current dynamos, transformers, and motors; and methods for testing alternating current machinery. The time devoted to laboratory work is occupied in the examination of alternating current phenomena, and in testing machines. Jackson's Text-book on Electromagnetism and the Construction of Dynamos, Vol II. Must be preceded by all courses in mathematics and Course 1 (82 *hours in class-room and* 96 *in laboratory and draughting room*). *Fall term*; *M., W., F., at* 10; *M., W.*, 2–4. *Winter term; M., W., F., at* 10; *M., W.*, 2–4. Professor JACKSON.
Required of Seniors in Electrical Engineering.

5. Electric Light and Transmission of Power. A study of the manufacture and use of arc and incandescent lamps; selection and arrangement of electrical machinery for generating plants; location, erection, and cost of distributing lines; and application of electric motors to the general purpose of power distribution. Lectures based on Russell's Electric Light Cables and Kapp's Electric Transmission of Energy. *Spring term; M., Tu., W., Th., F., at* 12 (50 *hours in class-room*). Professor JACKSON.
Required of Seniors in Electrical Engineering.

6. *Electricity in Engineering Operations.

(a) Electric Railways. Treats of the roadbed, rolling stock, electric circuits, and power plants for city, town, and suburban railways; the location and construction of street railways in cities and towns; track foundation and types of rail; selection of cars and motors to be used under different conditions; methods of conveying the electric current from the generator to the motors, and the best methods for meeting the severe conditions imposed on electric railway power plants. Lectures based on notes by the professors. *Fall term; M, Tu., Th., at* 11 (42 *hours in class-room*). Professors JACKSON and WHITNEY.

(b) Electricity in Mining and Quarrying. A discussion of the practice in mining and quarrying where electricity can be satisfactorily applied; the use of electric motors

*See foot note page 132.

on locomotives, hoisters, pumps, coal cutters, drills, and derricks, and the advantages and limiting conditions of long-distance transmission of power by electricity from water power to mines. Lectures. *Winter term; Tu., Th., at* 12 (*24 hours in class-room*). Professor JACKSON.

(c) Station Management and Estimates. Includes the effect on operating expenses of the arrangement of power and generating plants and circuits, and the use of meters. The greater part of the time is given to this discussion on account of its importance. Some time is spent in estimating costs of power and generating plants, and the cost of lines and weights of copper. Lectures. *Spring term; M., Tu., W., Th., F., at* 10 (*50 hours in class-room*). Professor JACKSON.

Required of Seniors in Electrical Engineering.

7. Mathematical Theory of Electricity and Magnetism. (a). Elementary Theory. This course is offered to students who have completed Courses 2 in Physics and 2 in Electrical Engineering. It follows the treatment of the subject as given in Gray's Theory of Absolute Measurements in Electricity and Magnetism. Must be preceded by all courses in mathematics. *Fall term: five times a week* (*70 hours in class-room*). Professor DAVIES.

(b) Advanced Theory. This is an amplification of Course 7a. The work includes a mathematical course in the theory of elasticity and its application by analogy to the laws of electricity and magnetism. The instruction is by lectures and references to Maxwell's Electricity and Magnetism, Mascart and Joubert's Electricity and Magnetism, Mathieu's Electro-dynamique, etc. Must be preceded by Course 7a. *Winter and spring terms; five times a week* (*110 hours in class-room*). Professor DAVIES.

Elective for Seniors in Electrical Engineering.

8. Graduate Work. Advanced work as assigned after consultation. Professors JACKSON and DAVIES.

Laboratory Work. All laboratory instruction is made to conform with, and illustrate, the class-room instruction. Of the total number of hours given to instruction in the elec-

trical engineering courses, about one-half is devoted to work in the laboratories. Students are advised to use their extra time in additional work in the shops and laboratories.

STRUCTURAL ENGINEERING.

PROFESSOR TURNEAURE AND PROFESSOR WHITNEY.

1. Elementary Drawing. During the summer vacation, preceding the Junior year, each student is expected to make full detail measurements of a railway or highway bridge of about 100-foot span. In the fall term he makes a complete drawing of the structure from these measurements, carefully studying the various details. *Fall term; Tu., Th.*, 8-10 (56 *hours in drawing-room*). Professor TURNEAURE.

   Required of Juniors in Civil Engineering.

2. Masonry Construction and Testing of Materials. (a) Prepar- and using the materials, foundations, masonry structures, as dams, walls, piers, abutments, and culverts; general theory of the distribution of forces. Text-book: Baker's Masonry Construction. *Fall term; Tu., Th., at* 12 (28 *hours in class room*). Professor WHITNEY.

   (b) Testing of Portland and Rosendale cements, brick, stone, and timber. *Winter term; Tu., Th.*, 2-4 (48 *hours in the laboratory*). Professor WHITNEY.

   Required of Juniors in Civil Engineering.

3. Engineering Architecture. Treats of those principles of artistic design applicable to engineering structures, especially those of masonry. *Winter term; twelve lectures in connection with Course* 4.

4. Masonry Arches. A discussion of the theory of the stability of masonry arches, both right and oblique is followed by the complete design and architectural treatment of an arch. *Winter term; M., Tu., W., Th., F.*, 8-10. (*mainly draughting*). Professor TURNEAURE.

   Required of Juniors in Civil Engineering.

5. Theory of Structures. The instruction in this subject is by text-book, together with the working of numerous problems. Text-book: Johnson, Bryan and Turneaure's "Modern Framed Structures."

(a) Simple Bridge Trusses. Determination of stresses by both graphical and analytical methods in the modern types of trusses for uniform and for concentrated moving loads. *Spring term; M., Tu., Th., F., at* 11 (32 *hours in class-room*). Professor TURNEAURE.

Required of Juniors in Civil Engineering.

(b) Suspension, Swing, Cantilever, and Arch Bridges. Theory of stresses and problems. *Last half of fall term; M., Tu., W., Th., F., at* 11 (35 *hours in class-room*). Professor TURNEAURE.

Required of Seniors in Civil Engineering.

6. Bridge Design. Formulæ for working stresses, design of individual truss members, deflection formulæ, secondary stresses and questions relating to the designing of details. *First half of fall term; M., Tu., W., Th., F., at* 11 (35 *hours in class-room*). Professor TURNEAURE.

Required of Seniors in Civil Engineering.

7. Designs and Estimates. This work consists in the designing of one structure of each kind mentioned, the estimating of material and cost, the working up of details, and the preparation of detail drawings. For at least one structure, full working drawings are made.

(a) Elementary Designing. Details in wood and iron, with the complete design of a simple wooden truss and of an iron roof truss. *Spring term; Tu., W., Th., F.*, 8–10. (64 *hours in draughting room*). Professor TURNEAURE.

Required of Juniors in Civil Engineering.

(b) Plate and Lattice Girders. *Fall term; M., T., W., Th., F.*, 8–10. (140 *hours in draughting room*). Professor TURNEAURE.

Required of Seniors in Civil Engineering.

(c) Pin Connected Trusses. *Winter term; M., T., W., Th.*, 8–10. (96 *hours in draughting-room*). Professor TURNEAURE.

Required of Seniors in Civil Engineering.

8. Specifications, Inspection, and Testing. In this course a study is made of bridge specifications, properties of structural iron and steel, results and methods of testing, and specifications for quality of material. The instruction is given by means of lectures, laboratory experiments, and reports. *Spring term; M.*, 8; *W.*, 11. Professor TURNEAURE.

Required of Seniors in Civil Engineering.

MACHINE DESIGN.

PROFESSOR JONES AND MR. MACK.

1. Elements of Drawing. The use of drawing instruments and plain lettering are first taught, followed by freehand sketching of machine parts; from the sketches complete working drawings are made. The sketches are from parts of machines in actual use, having correct proportions and outlines. *Fall term; M., Tu., W., Th., F.*, 8–10, 2–4 (140 *hours in draughting-room*). Mr. MACK.

Required of Freshmen in Mechanical and Electrical Engineering.

2. Draughting, Tracing, and Blue Printing. During this course drawings are made from actual machines, models, and plates, the object being to give the student a general idea of the forms of machine parts and methods of putting them together. Where plates are used they are as far as possible duplicates of drawings in use at the time for construction in the best machine establishments of today. Standard plates are used to illustrate combinations not shown by the above methods. Finally an entire machine of moderate complexity is taken as a model from which complete working drawings are made. Line shading, tracing, and blue printing are taught during this course. *Fall term; M., W., and Tu., Th.*, 10–12. *Winter term; M., W., F.*, 10–12. *Spring term; M., Tu., W., Th., F.*, 10–12 (228 *hours in draughting-room*). Mr. MACK.

Required of Sophomores in Mechanical and Electrical Engineering.

3. Materials. Elementary Metallurgy of Iron and Steel. Methods of testing materials and interpretation of results. The effect of change of chemical composition, mechanical working, and heat treatment upon the physical properties of materials. In this work the magnetic and electrical properties of materials that are of value to the engineer are studied. *Fall term: Tu.*, (*Section I at* 10; *Section II at* 11.) *Th., F., at* 10 (42 *hours in class-room*). Professor JONES.

Required of Juniors in Engineering.

4. Kinematics. A study of the relative motions in machine parts; belting, tooth gears, cams, linkages, and velocity diagrams are considered. *Fall term; twice a week, M., W., at* 10 (28 *hours in class-room*). Professor JONES.

Required of Juniors in Mechanical and Electrical Engineering.

5. Graphic Statics of Mechanism. An application of graphic statics to finding the stresses and moments in machine members with a view to determining their proper forms and dimensions. *Winter term, twice a week* (24 *hours*) *in class; Tu., Th., at* 10; *five times a week* (120 *hours*) *draughting, M., Tu., W., Th., F.*, 8-10. *Spring term: M., Tu., W., Th., F.*, 11-1 (100 *hours*) *draughting.* Professor JONES.

Required of Juniors in Mechanical and Electrical Engineering.

6. Elements of Machines. A study of screw fastenings, riveted joints, journals, bearings, sliding surfaces, etc. Also the outline and cross-sectional forms of machine parts *Spring term; Tu., Th., at* 9 (20 *hours in class*). Professor JONES.

Required of Juniors in Mechanical and Electrical Engineering.

7. (a) Complete Machines. The principles of the preceding courses are applied in the design of a complete machine. The parts are considered with regard to strength, form, beauty of outline, and cost of construction, the object being to produce an efficient, durable machine with pleasing outlines and the minimum complexity allowable for its purpose. The methods for obtaining the best machines at the lowest costs are given special attention. The

manufacture of a large number of machines of the same pattern is studied with regard to economy, rapidity, and accuracy. *Fall term; M., at* 11; *Tu., Th., at* 12 (42 *hours in class*); *M., T., W., Th., F.*, 8-10 (140 *hours draughting*). *Winter term; Tu., Th., at* 12 (24 *hours in class*); *M., W., F.*, 11-1 (72 *hours draughting*). Professor JONES.

Required of Seniors in Mechanical Engineering.

7. (b) Complete Machines. This work is in the main the same as that of 7 (a), the only difference being that electrical machinery is designed during the latter portion of the course. Direct and alternating current dynamos and transformers have special attention. The planning of an electric light or power station is studied with regard to arrangement of machinery. *Fall term, three times a week;* (42 *hours in class*) *twice a week* (56 *hours draughting*). *Winter term; Tu., Th.*, 11 (24 *hours in class*); *M., W., F.*, 11-1 (72 *hours draughting*). Professor JONES.

Required of Seniors in Electrical Engineering.

SHOP WORK.

PROFESSOR KING, MR. YOUNG, MR. RICHARDS, MR. HIGGINGS, MR. GODDARD, MR. LOTTES, AND MR. HAGAR.

1. Bench and Machine Work in Wood. (a) A systematic course in the use of the plane, saw, gouge, bit, and kindred tools. This covers the principles of joining and joint work involved in building construction. Lectures each day precede new operations. Exercises in free-hand sketching are required three times a week. *First half of fall term* (35 *hours*). *M., W., F.*, 8-10; *M W., Th.*, 2-4; *F.*, 2-5; *S.*, 8-11.

(b) Systematic training at the lathe in the use of the gouge and chisel in plain and ornamental turning in hard and soft wood. Lectures and sketching as before. *Last half of fall term; M., W., F.*, 8-10; *W., Th.*, 2-4; *F.*, 2-5; *S.*, 8-11 (35 *hours*). Professor KING, Mr. RICHARDS, and Mr. HAGAR.

Required of Freshmen in Engineering.

2. Foundry Work. Practice in pattern making and moulding. The patterns chosen are those giving the best illustration of the principles involved in their construction and in the methods of moulding. Lectures on these subjects and on the methods of core making and core work are given with this course. Free-hand sketching is required. *Winter term; M., W., F.*, 8-10; *W., Th.*, 2-4; *F.*, 2-5; *S.*, 8-11 (60 *hours*). Professor KING and Mr. HIGGINS.

Required of Freshmen in Engineering.

3. Bench Work in Iron. Embraces practice in wrought and cast iron with the hammer, chisel and file at the vise. *Spring term; M., W., F.*, 8-10; *M., W.*, 2-4; *F.*, 2-5; *S.*, 8-11 (50 *hours*). Professor KING and Mr. YOUNG.

Required of Freshmen in Engineering.

4. Production of Flat Surfaces and Straight Edges. Training in the use of file and scraper on surfaces of large area. Lectures treating of the lathe and milling machine. *Fall term; M., W.*, 9-12; *Tu., Th.*, 9-1; *S.*, 8-12 (56 *hours*). Professor KING and Mr. YOUNG.

Required of Sophomores in Mechanical and Electrical Engineering.

5. Machine Work in Iron. Practice on the engine lathe, in connection with which are taught the elementary features of boring, turning and screw cutting. Lectures on these subjects weekly. *Fall term; M., W.*, 9-12; *Tu., Th.*, 9-1; *S.*, 8-12 (84 *hours*). Professor KING and Mr. YOUNG.

Required of Sophomores in Mechanical and Electrical Engineering (56 *and* 84 *hours respectively*).

6. Tool Making. The methods of making taps and dies for cutting screw threads are the prominent features. Some instruction in brass work is also given. *Fall term; F.*, 8-10; *W., F.*, 2-5 (112 *hours*). Professor KING and Mr. YOUNG.

Required of Juniors in Mechanical Engineering. (37 *hours*). Required of Juniors in Electrical Engineering. *Fall term; M.*, 2-4; *Tu., Th.*, 2-5.

7. Machine Construction. Attention is given to the cost of production. *Winter term; M., W.*, 2-5; *F.*, 2-6 (48 *hours*). Required of Juniors in Mechanical Engineering.
Spring term; M., 2-4; *S.*, 8-12 (60 *hours*). Required of Juniors in Electrical Engineering. Professor KING.

8. Forge Work. Training in the fundamental features of forged practice, as drawing, upsetting, bending, welding, tool making, and tempering. *Winter term; W., F.*, 11-1; *M., W.*, 2-5; *F.*, 2-6 (84 *hours*).
Required of Sophomores in Mechanical and Electrical Engineering.
M., W., F., 8-10; (60 *hours*). Required of Freshmen in Civil Engineering. Professor KING and Mr. LOTTES.

9. Practice at the Lathe and Milling Machine. This includes instruction in the methods of determining the diameter of blanks for spur, bevel, spiral, and tangent wheels on the lathe, and in cutting the teeth with the milling machine. *Spring term; M., W., Th.*, 2-4; *F.*, 2-6 (100 *hours*).
Required of Juniors in Mechanical Engineering.

Fall term; M., 2-4; *Tu., Th.*, 2-5 (75 *hours*).
Required of Juniors in Electrical Engineering. Professor KING and Mr. YOUNG.

10. Construction and Pattern Work. Practice in Pattern Work, and fitting together machine parts. This will require also some moulding and forge work, including tool dress- and tempering. *Fall term; Tu., Th*, 2-5 (84 *hours*). Professor KING, Mr. YOUNG and Mr. LOTTES.
Required of Seniors in Mechanical Engineering.

11. Construction. The time in this course is devoted to the construction and completion of the machines or their parts not finished during the previous term. *Winter term, M., W., F.*, 2-4 (84 *hours*). Professor KING and Mr. YOUNG.
Required of Seniors in Mechanical Engineering.

12. This course is similar to Course 11, but to it it will be added practice in the erection of line shafting and machinery. Lectures on the two last subjects. *Spring term: Tu., Th., at* 12; *M., W., Th., F.*, 2-4 (100 *hours*). Professor KING.

COLLEGE OF AGRICULTURE.

CORPS OF INSTRUCTION.

C. K. ADAMS, LL.D., President of the University.
W. A. HENRY, AGR.B., Dean, Professor of Agriculture.
S. M. BABCOCK, PH.D., Professor of Agricultural Chemistry.
J. A. CRAIG, B.S.A., Professor of Animal Husbandry.
E. S. GOFF, Professor of Horticulture and Economic Entomology.
F. H. KING, Professor of Agricultural Physics.
F. W. WOLL, M.S., Assistant Professor of Agricultural Chemistry.
H. L. RUSSELL, PH.D., Assistant Professor of Bacteriology.
*W. H. MORRISON, Superintendent of Farmers' Institutes.
J. W. DECKER, AGR.B., Instructor in Dairying.
W. G. CLARK, V.S., Instructor in Veterinary Science.
C. R. BARNES, PH.D , Professor of Botany.
E. A. BIRGE, PH.D., Professor of Zoology.
W. W. DANIELLS, M.S., Professor of Chemistry.
D. B. FRANKENBURGER, A.M., Professor of Rhetoric.
H. W. HILLYER, PH.D., Assistant Professor of Organic Chemistry.
C. I. KING, Professor of Practical Mechanics.
H. J. MCGRATH, Professor of Military Science and Tactics.
W. H. ROSENSTENGEL, A.M., Professor of German.
W. A. SCOTT, Ph.D., Associate Professor of Political Economy.
C. R. VAN HISE, PH.D., Professor of Geology.
C. A. VAN VELZER, PH.D., Professor of Mathematics.
B. F. SNOW, PH.D., Professor of Physics.
A. W. RICHTER, M.E., Assistant Professor of Steam Engineering.
H. J. NOYES, Instructor in Butter-making.
A. SCHOENMAN, Instructor in Milk Testing.
E. H. HAGEMAN, Instructor at the Separators.
F. WALKER, Instructor at the Separators.
W. E. DOANE, Instructor at the Butter-worker.
J. E. KNOTT, Instructor in Cheese-making.
F. WISMER, Instructor in Cheese-making.

OFFICERS OF THE EXPERIMENT STATION.

W. A. HENRY, Director.
S. M. BABCOCK, Chief Chemist.
F. H. KING, Agricultural Physicist.

* Died December 13, 1893.

E. S. GOFF, Horticulturist and Entomologist.
J. A. CRAIG, Animal Husbandry.
F. W. WOLL, Assistant Chemist.
H. L. RUSSELL, Bacteriologist.
J. W. DECKER, Dairying.
WINONA MERRICK, Clerk and Librarian.

INSTITUTE SPEAKERS.

S. M. Babcock, University.
J. A. Craig, University.
E. S. Goff, University.
W. A. Henry, University.
F. H. King, University.
L. H. Adams, University.
J. W. Decker, University.
M. T. Allen, Waupaca Co.
A. A. Arnold, Trempealeau Co.
C. S. Arnold, Walworth Co.
A. D. Barnes, Waupaca Co.
W. D. Barnes, Outagamie Co.
H. A. Briggs, Walworth Co.
W. C. Bradley, St. Croix Co.
W. D. Boynton, Outagamie Co.
H. M. Culbertson, Outagamie Co.
W. H. Cole, Dane Co.
R. J. Coe, Jefferson Co.
Thos. Convey, Iowa Co.
F. C. Curtis, Columbia Co.
A. J. Decker, Fond du Lac Co.
F. C. Edwards, Jefferson Co.
C. H. Everett, Rock Co.
E. G. Fuller, Calumet Co.
A. O. Fox, Dane Co.
F. A. George, Trempealeau Co.
C. P. Goodrich, Jefferson Co.
Geo. C. Hill, Fond du Lac Co.
C. H. Hamilton, Fond du Lac Co.
R. J. Hennessey, St. Croix Co.
B. S. Hoxie, Rock Co.
S. S. Jones, Rock Co.
R. S. Kingman, Monroe Co.
Geo. J. Kellogg, Rock Co.
Chas. Linse, La Crosse Co.
Geo. McKerrow, Waukesha Co.
John McCarthy, Dane Co.
Geo. Martin, St. Croix Co.
A. F. Noyes, Dodge Co.
Byron Snyder, Rock Co.
A. Selle, Ozaukee Co.
L. Spaulding, Pierce Co.
J. M. True, Sauk Co.
H. C. Taylor, Rock Co.
Chas. Thorp, Dodge Co.
T. J. Van Matre, La Fayette Co.
John Wilson, Dane Co.

PLAN OF AGRICULTURAL EDUCATION.

The system of education adopted by the College of Agriculture has three aims:

First, to develop agricultural science through investigation and experiment, and to disseminate the same through bulletins and reports;

Second, to give instruction in agriculture at the University;

Third, to disseminate agricultural knowledge among the farmers of the state by means of institutes and popular publications.

I. THE AGRICULTURAL EXPERIMENT STATION.

The purpose of the Experiment Station is the promotion of agricultural science by investigation and experimentation. In the choice of subjects it endeavors to select those which possess the greatest importance to the farmers of Wisconsin, so far as the facilities at hand permit. At all times there is an earnest effort to give the investigations a careful fundamental character in order that the results may be real contributions to agricultural science. The Station is also a means of disseminating general and miscellaneous information on agricultural topics, and its staff cheerfully devotes the necessary time to private and public correspondence and to personal interviews.

The offices and laboratories of the Station are in Agricultural Hall, on the University grounds. The Dairy Building lies midway between the general group of college buildings and the University farm. The Horticultural Building, erected during the summer of 1893, is located near the Dairy Building. The farm, with its buildings and the experimental grounds, adjoins the campus on the west.

By direction of the general government, which supplies a large portion of the funds for maintaining the Experiment Station, there are issued an annual report and quarterly bulletins. Nine reports and thirty-eight bulletins have been issued to date. Fifteen thousand copies of the report are printed annually, and the edition of the bulletins generally comprises ten thousand copies. These bulletins and reports are free to all residents of the State upon application. The Station mailing list now embraces about eight thousand names of farmers and others to whom the reports and bulletins are regularly sent.

II. INSTRUCTION AT THE UNIVERSITY.

Systematic courses in agriculture have been arranged to meet the wants of students having different purposes in view.

The *Graduate Course* offers to advanced students opportunities for professional training and original investigation, made possible through a well equipped and active Experiment Station, associated with numerous amply furnished scientific laboratories. The special lines of study will be left largely to the selection of the students, subject to the approval of the Agricultural Faculty. It will be practicable to a large extent for such students to participate

in experiments in progress and, after suitable experience, to conduct independent investigations. When contributions to knowledge of permanent value are made they will be published through bulletins of the Experiment Station under the name of the contributor.

The *Long Course* offers a liberal and scientific training along agricultural lines; it opens an avenue to a professional mastery of agricultural chemistry, agricultural physics, animal husbandry, dairying, and other special phases of the subject. Besides the strictly professional branches it embraces chemistry, physics, botany, zoology, geology, and similar branches which have an agricultural bearing. The field is so broad, however, that it is impossible for the students in four years to pursue all the courses offered, in addition to acquiring the necessary fundamental studies, and hence a large liberty of selection is allowed.

The *Short Course* is adapted to those who have but limited preparation and can devote only a short time to study, and who wish to return at once to the active operations of the farm, and therefore desire the greatest amount of available and directly useful knowledge that can be acquired in the brief time allowed.

The *Dairy Course* is designed to meet the wants of those who intend to operate creameries and cheese factories.

TERMS OF ADMISSION.

Graduate Course in Agriculture. Graduates of this University and of other colleges and universities in good standing are admitted to this course without examination.

Long Course in Agriculture. The following branches are required: English grammar, including sentential analysis and orthography; arithmetic, algebra through quadratics, and plane and solid geometry; political and physical geography; history of the United States; physics; physiology and botany. Students from accredited schools will be admitted on the same bas s as required for the General Science or English courses.

Short Course in Agriculture. Students in this course must be at least sixteen years of age, and have a good common school education. No entrance examinations are required, but those who come poorly prepared cannot expect the full benefits of the course.

Course in Dairying. The terms of admission to this course will be the same as for the Short Course.

Special Students in Agriculture. As many of the youth of the farming communities are not within reach of schools giving instruction in all the branches required for admission to the Long Course, limited concessions will be made to young men of exceptional strength and maturity by which they will be permitted to enter the University as special students in agriculture.

DEGREES.

The degree of Bachelor of Science in Agriculture is conferred on students who successfully complete the Long Course in Agriculture. The degree of Master of Science in Agriculture is conferred on Bachelors of Science in Agriculture who complete one year advance study at the University and present an acceptable thesis on a topic approved by the Faculty.

LONG COURSE IN AGRICULTURE.

Freshman Year.

Biology, full study for the year.
Mathematics, algebra and trigonometry, four-fifths study for the year.
German, four-fifths study for the year.
English, two-fifths study for the year.
Military Drill, Gymnastics, and Hygiene.

Sophomore Year.

Chemistry, full study for the year.
Physics, full study for the year.
German, four-fifths study for the year.
English, two-fifths study for the year.
Military Drill and Gymnastics.

Junior and Senior Years.

Two years in Agricultural Chemistry, Agricultural Physics, Animal Husbandry, or Horticulture, as a major subject.
One year in one of the above-named subjects to be assigned by the professor in charge of the major subject.
One term in Veterinary Science.
Elective studies enough to make thirty-six terms' work.

SHORT COURSE IN AGRICULTURE.

The Short Course in Agriculture is proving a very popular course for young farmers who can devote but a limited amount of time to preparatory study for their chosen vocation. The subjects of this course are elective, and will occupy the whole time of the student during the winter term of two years. The course embraces the following topics:

Thirty lectures, mainly devoted to feeds and feeding, by Professor Henry.

Thirty lectures on breeds and breeding, with practice in scoring and judging improved breeds of live-stock, by Professor Craig.

Thirty-six lectures and recitations on the elements of agricultural chemistry, by Dr. Babcock.

Sixty lectures and recitations on agricultural physics and meteorology, by Professor F. H. King.

Sixty lectures with laboratory practice in horticulture and economic entomology, by Professor Goff.

Sixty lectures with demonstrations on the anatomy, physiology and hygiene of domestic animals, by Dr. Clark.

One hundred and twenty hours at the work-bench and forge in practical mechanics, by Professor C. I. King.

Twenty-four lectures on dairying, by Dr. Babcock.

Seventy-two hours' practice in the creamery and dairy laboratory, by Mr. Bennett.

Twelve lectures on the economics of agriculture, by Professor Scott.

A course in farm bookkeeping by Mr. T. A. Stanley.

Six lectures with demonstrations in bacteriology on the relation of bacteria to the various important general questions in agriculture by Assistant Professor Russell.

Illustrated circulars descriptive of the Short Course will be sent on application.

COURSE IN DAIRYING.

The instruction in dairying is divided into four courses. The dairy class is divided into three sections, one of which is assigned daily to the laboratory, a second to the creamery, and a third to the cheese factory. The sections alternate so that each student receives instruction twice a week in each of the three departments. The courses are arranged as follows:

1. **Lectures and Class-room Work:**

(1) Twenty-four lectures by Dr. Babcock on the constitution of milk, the conditions which affect creaming and churning, methods of milk testing, the preservation of milk, etc.

(2) Six lectures with demonstrations by Dr. Russell on the influence of bacteria in the dairy.

(3) Eight lectures by Professor F. H. King on heating, ventilation, and other physical problems directly connected with dairy practice.

(4) Ten lectures and demonstrations by Assistant Professor Richter on the careand management of the boiler and engine.

(5) Ten lectures by Dr. Clark on the common diseases of the dairy cow.

(6) Eight lectures by Professor Henry on the feeding and management of dairy stock.

(7) Eight lectures by Professor Craig on breeding and selection of dairy stock.

2. **Milk Testing.** This embraces instruction in the laboratory by Dr. Babcock and Mr. Schoenmann in estimating the fat in milk, butter, and cheese by methods adapted to the factory and factory operators. Six hours per week.

3. **Butter Making.** Instruction in this course is given by Mr. H. J. Noyes, with assistants. Butter making is carried on daily on the creamery plan. The student learns to operate the several forms of power, centrifugal separators, and the butter extractor. They attend to the ripening of the cream, churning and packing butter, carrying on all the operations as they would be conducted in a creamery. Twelve hours per week.

4. **Cheese Making.** In this course, Mr. Decker, with assistants, gives daily instructions in the manufacture of cheese, the operations being carried on as in the regular factory, the student being required to take careful notes and make reports of the process. Sixteen hours per week.

ADVANCED DAIRY WORK.

Those pupils who have had experience before joining us, after passing examinations in the practical work of the creamery and cheese factory, will be advanced to the class in experimental dairying, where problems connected with the dairy will be studied by the class.

Students who are thoroughly familiar with the use of the compound microscope will be given opportunities for the prosecution

of bacteriology in reference to dairy problems. The work will be mainly laboratory work supplemented by the practical application of bacteriological methods in the creamery and dairy.

EXAMINATIONS AND CERTIFICATES.

At intervals during the term and at its close, students are subjected to examinations, written and practical. To secure a dairy certificate, the candidate must have spent a full term in the dairy school, and passed a satisfactory examination in all the courses. Further, he must have worked in a creamery or cheese factory for two full seasons of not less than seven months each. One of these seasons must follow the period spent in the dairy school. During this time the candidate must have practical charge of the factory in which he is working, and will report the operations therein fully or as directed on proper blanks furnished by the University. The University holds the right to send an authorized person to inspect the factory of the candidate. If all the conditions are satisfactorily complied with, a dairy certificate will be issued to the candidate.

On account of the expense of sending an inspector, the University does not bind itself to issue dairy certificates to students who operate factories in other states.

Illustrated circulars descriptive of the Dairy Course will be sent on application.

DEPARTMENTS OF INSTRUCTION.

AGRICULTURAL CHEMISTRY.

PROFESSOR BABCOCK AND ASSISTANT PROFESSOR WOLL.

1. The Origin, Composition, and Classification of Soils. The composition of air and the amount of plant food which it supplies. The elements necessary for plant development. The proximate composition of plants. The exhaustion of soils by different crops; the rotation of crops. The nitrogen problem. Classification of feeding stuffs; relative value of different systems of preserving forage crops. The silo and its losses. Manures, their classification, composition, sources and relative value. Manurial value of fodders. Artificial fertilizers. Preservation and application of manures. The composition of the animal body. Animal nutrition. Digestibility of foods. *Lectures and recitations during fall and spring terms; twice a week.* Assistant Professor WOLL.

2. Analysis of Fodders, Dairy Products and Fertilizers. *Laboratory work during fall and spring terms; three times a week.* Assistant Professor WOLL.

3. The Chemistry of the Dairy; the composition and physical proprieties of milk and its manufactured products; the principles involved in modern dairy practice. Detection of adulterations, etc. *Lectures during winter term; five times a week.* Professor BABCOCK.

4. Advanced and original Work. Ash analysis. Chemical examination of soils. Estimation of sugars, starch, etc. Original investigations in the chemical laboratory. *Laboratory work during the year; five times a week.* Professor BABCOCK and Assistant Professor WOLL.

AGRICULTURAL PHYSICS.

PROFESSOR KING.

1. Meteorology. The aim of this course is, first, to cover the general principles of the subject and familiarize the student with meteorological methods and instruments, and second, to deal specially with the agricultural and horticultural phases of the subject. *Lectures and laboratory work; five times a week, fall term.*

2. Farm Engineering. Farm drainage, the construction and maintenance of country roads, and the construction of farm buildings. *Five times a week, winter term.*

3. Soil Physics. Physical characteristics, origin, and classification of soils; needs and methods of soil aeration; storage capacity of soils for water; movements of soil water as affected by texture, composition, fertilizers, and temperature; principles governing and the methods of determining soil temperatures, principles, methods, and implements of tillage. *Five times a week; spring term.*

4. Original investigations in the physical laboratory and field. *Five times a week through the year.*

ANIMAL HUSBANDRY.

PROFESSOR HENRY AND PROFESSOR CRAIG.

1. The Breeds of Live Stock. Students taking this course are trained in judging live stock by the use of typical animals, skeletons, charts, models, and score cards. As aids to the work use will be made of the stock on the University Farm and farms in the vicinity of Madison; also many photographic slides projected with the electric lantern. The agricultural library now embraces over 400 volumes of stud books, herd books, and flock registers. *Five times a week, fall and winter terms.* Professor CRAIG.

2. Breeding. Principles of breeding (heredity, fecundity, etc.), methods of breeding (line breeding, inter-breeding, cross-breeding, etc.), and the practice of breeding (horse, cattle, sheep, and swine breeding), taught by lectures, text-book

work, and study of the practices of breeders as shown by the various stock registries. The text-books for this subcourse are Darwin's Animals and Plants under Domestication, and Miles' Stock Breeding. *Five times a week, spring term.* Professor CRAIG.

3. Feeds and Feeding. Chemical constituents of feeding materials, amount, combination and form of these necessary to give the best results with the various kinds of live stock. The student will familiarize himself with German feeding tables, the feeding trials conducted at our own Station and the experimental work now in progress. Armsby's Manual of Cattle Feeding will be used as a text-book. *Five times a week, winter term.* Professor HENRY.

4. Advanced work in Feeding and Breeding. Having completed the previous subcourses the student is in position to carry on investigations through a study of the Experiment Stations of this country and the old world Further he will assist in conducting feeding trials at our own Station. *Five times a week, one year.* Professor HENRY and Professor CRAIG.

HORTICULTURE.

PROFESSOR GOFF.

1. General Principles of Horticulture. Propagation, planting, cultivating, pruning, and breeding of economic plants. Lectures, recitations, and laboratory work. *Five times a week, fall term.*

2. Economic Horticulture. Special instructions in growing, harvesting, marketing, and preserving the principal fruits and vegetables of our climate, with the leading injurious insects and diseases that prey upon these, and the best method of preventing their ravages. Lectures, recitations and laboratory work. *Five times a week, winter term.*

3. Æsthetic Horticulture. The principles of ornamental planting and of laying out gardens and pleasure grounds, with the formation and management of lawns, and the adaptation of decorative plants. Lectures and recitations. *Five times a week, spring term.*

4. Special Investigations in subjects relating to the propagation and rearing of economic plants, including the suppression of injurious insects and diseases. Field and laboratory work. *Five times a week throughout the year.*

VETERINARY SCIENCE.

DR. CLARK.

It is intended by this course to impart such general knowledge of veterinary science as will enable the student to meet intelligently such emergencies as frequently arise among live-stock and require prompt action, and to coöperate understandingly with the qualified practitioner. It will also be of service as preliminary instruction for those who contemplate entering any of the regular veterinary colleges, as the course will comprise an outline of all the principal branches of the science. The lectures will be illustrated by a very complete set of skeletons, charts, models, specimens, etc. Among these is one of the Auzoux anatomical models of the Arab horse which is so constructed that it can be dissected to show over 3,000 anatomical parts. *Five times a week, winter term.*

THE ECONOMICS OF AGRICULTURE.

PROFESSOR SCOTT.

The object of this course is to furnish students of agriculture with an opportunity for acquaintance with the social aspects of their subject. The farmer is profoundly affected by general industrial conditions, and a knowledge of the forces which determine and modify these conditions is essential to an intelligent prosecution of his business. This course will consist of one lecture each week during the term, and will embrace such topics as: the mutual relations of agriculture and other industries; value and prices with especial reference to land and agricultural products; money, its functions and varieties; banks and their functions; industrial and monetary crises and panics; systems of land tenure, etc. After each lecture, an hour will be devoted to discussion, quiz and questions asked by the students.

BACTERIOLOGY.

ASSISTANT PROFESSOR RUSSELL.

The rapid development of bacteriology along agricultural lines necessitates the thorough understanding of the general principles of this science by those students that desire to keep abreast of the progress of the day. The University has now a fully equipped laboratory for the prosecution of class and research work along these lines.

1. Agricultural Bacteriology. Students will be taught the relation of bacteria to various natural processes that are of utmost importance to the agriculturist, such as the fertilization and restoration of soils by the nitrifying bacteria and by legume tubercles, the germ theory of disease in man, domestic animals and plants, and the general principles of fermentation and decomposition, and their application to practical agriculture.

2. Dairy Bacteriology. This course is limited to the relation of bacteria to dairy problems, and will include not only laboratory work in the laboratory, but the practical application of the pure culture system in butter making and a thorough study of the normal fermentations which occur in milk, as well as the abnormal fermentations that are such a source of loss in the dairy industry.

GENERAL INFORMATION

The facilities for agricultural instruction are already large and steadily increasing. Agricultural Hall is a stone building, one hundred and twenty feet in length by forty-two in width, four stories in height. It contains two large lecture rooms, offices for the several instructors and investigators, library rooms, and several chemical and physical laboratories.

The Hiram Smith Hall, devoted to dairying, was completed in 1891, and affords ample opportunities for the study of the most approved methods used in the manufacture of butter and cheese. The building is fully equipped with the best modern apparatus.

The third building, devoted exclusively to agriculture, is Horticultural Hall, just completed. This building is three stories in height with large green-houses attached.

At the Experiment Station Farm are the fields for investigation, the barns, and live-stock. Here as elsewhere all arrangements have in view investigation and instruction.

By its association with amply equipped laboratories of science and the practical arts, with departments in which are taught all the foreign languages that contain much reliable agricultural literature, with an active Experiment Station, equipped with special laboratories and library, and with an Experiment Farm where practical tests are carried on, guided by experienced talent, the College of Agriculture affords exceptional opportunities to those who desire to become professional experts.

Besides these facilities the College of Agriculture has at its command, for the use of the students, the general laboratory facilities of the University, so far as they relate to general chemistry, physics, practical mechanics, biology, geology, etc. See pages 22–27, 88–90.

LIBRARIES.

The Agricultural Library contains over 4,000 bound volumes and several hundred pamphlets, all of which are available for the use of students. They have access also to the various other libraries of the University and the city. See pages 22–23.

SOCIETIES.

Two societies are maintained, one by the students of the several agricultural courses, and one by those of the course in dairying. These organizations afford valuable opportunities for discussions of the many professional and practical questions concerning agriculture and dairying.

THE LUDLOW AND HODGES SCHOLARSHIPS.

Messrs. A. Ludlow and G. T. Hodges of Monroe, Green county, have announced four scholarships in the Short Course in Agriculture, the same covering the necessary expenses of students taking this course. These are to be known as the Ludlow and Hodges scholarships. They are awarded to residents of Green county, the selection being made by the officers of the Green County Agricultural Society. These generous gifts should be the means of awakening a larger interest in agricultural instruction at the University.

THE OGILVIE MEDAL.

As a stimulus to the study of some of our improved breeds of live stock, Mr. R. B. Ogilvie, of Madison, has generously provided a gold medal of exquisite workmanship, valued at $75, to be awarded annually at commencement to the agricultural student who shall show the greatest proficiency in judging draught horses and the mutton breeds of sheep. In 1892 the medal was awarded to Mr. Arthur G. Hough, Winchester, Wis. In 1893 it was won by Mr. J. J. Tschudy, of Monroe, Wis.

ROOMS AND BOARD.

Furnished rooms cost from 75 cents to $1.50 per week for each occupant. Cost of table board in clubs varies from $2.00 to $2.50 per week.

FEES AND EXPENSES.

Tuition for residents of the State of Wisconsin	FREE.
Tuition for non-resident students in all courses, per term .	$6 00
Incidental fees for students in all courses:	
First term	5 00
Second term	5 00
Third term	2 00

Students will be charged for not less than one term, and no deductions will be made for voluntary absence. The fees required for dairy students will be announced in a circular which will be issued in the fall of 1894.

The expense of a Short Course student will vary from $60.00 to $75.00 for fees, room, board, washing, and necessary books. The necessary expenses of a dairy student will vary from $75.00 to $85.00 for the term. The expense of Long Course students per term need not exceed that here mentioned for Short Course students.

HORTICULTURAL HALL.

Horticultural Hall is located on the north slope of Observatory Hill near Hiram Smith Hall, the dairy school building. The plan contemplates accommodations for both horticulture and agricultural physics; the present structure includes only the main entrance and the horticultural wing. It is of white select brick with trimmings of pressed pink brick and Wauwatosa limestone, and covers an area 46 feet in width by 60 feet in length, being three full stories in height. The interior finish is known as mill construction, finished in oiled pine with tile lined walls.

In the first story are the lockers for the students' work clothes, the heating apparatus, janitor's room, and a large general work room.

The second story contains a large office, a microscope room, and a laboratory 36x39 feet. This laboratory is for instruction in plant analysis, grafting, budding, and other practical horticultural work. On the third floor is a reading room, herbarium room, and large lecture room. Around the walls of the lecture room and laboratory are numerous cases for holding illustrative apparatus, museum specimens, etc. At the rear of the building are two green houses each 22x75 feet, on the same level as the laboratory floor, from which they are reached. One house is equipped with benches where the students will have an assigned space for conducting studies with growing plants, cuttings, etc.

The second green house is unique in character. There are no posts or supports, the roof being carried by trusses, leaving the whole area, 22x75 feet, without obstructions of any kind. This area with its rich soil, constitutes a winter garden, in which the instructor can give instruction and practice with seed drills, cultivators, the planting of seeds, cuttings, orchard trees, etc. The building and green houses are heated by steam and supplied with water and gas. With its equipment the horticultural wing represents an outlay of nearly $25,000.

III. FARMERS' INSTITUTES.

The third division of work under the direction of the College of Agriculture is the instruction of farmers who are unable to come to the University for study. This is provided for through generous legislative provisions by which a carefully supervised system of farmers' institutes is maintained. The institutes are in immediate charge of a superintendent, who elaborates and controls the organization and execution of the institutes. He is aided by special conductors, who assist in perfecting the details and carrying the whole into effect. Members of the Agricultural Faculty render as much assistance as is consistent with their other duties. Experts in different departments are engaged to present special important themes. Lecturers are often brought from other states to treat on specific topics in which they are recognized authorities. Local talent is freely used, and not the least of the educational benefits is the development of latent ability in writing, speaking and experimenting which has followed as a natural result of the interest awakened by this important stimulus.

During the institute season of 1893-94, 76 institutes lasting two days each were held at the places named below:

LIST OF INSTITUTES HELD DURING THE SEASON 1893-94.

County.	Place.	County.	Place.
Adams	Friendship.	LaFayette	Darlington.
Barron	Chetek.	Manitowoc	Manitowoc.
Barron	Prairie Farm.	Marquette	Briggsville.
Buffalo	Fountain City.	Monroe	Wilton.
Buffalo	Mondovi.	Oconto	Stiles.
Calumet	Stockbridge.	Outagamie	Hortonville.
Chippewa	Bloomer.	Outagamie	Shitcoon.
Clark	Greenwood.	Ozaukee	Saukville.
Clark	Thorp.	Pepin	Durand.
Columbia	Lodi.	Pierce	Ellsworth.
Columbia	Wyocena.	Pierce	Maiden Rock.
Crawford	Mt. Stealing.	Polk	St. Croix Falls.
Dane	Morrisonville.	Portage	Almond.
Dane	Mt. Horeb.	Racine	Union Grove.
Dane	Oregon.	Racine	Waterford.
Dane	Verona.	Richland	Viola.
Dodge	Beaver Dam.	Rock	Orfordville.

County.	Place.	County.	Place.
Dodge	Mayville.	St. Croix	Glenwood.
Door	Sturgeon Bay.	St. Croix	New Richmond.
Dunn	Menomonie.	St. Croix	Wilson.
Fond du Lac	Calumetville.	Sauk	Spring Green.
Fond du Lac	Oakfield.	Sheboygan	Franklin.
Fond du Lac	Waupun.	Sheboygan	Sheboygan Falls.
Grant	Bloomington.	Trempealeau	Blair.
Grant	Montfort.	Trempealeau	Ettrick.
Grant	Platteville.	Vernon	Westby.
Green	Monroe.	Walworth	East Troy.
Green	Monticello.	Walworth	Walworth.
Iowa	Avoca.	Washington	Hartford.
Jackson	Alma Centre.	Washington	West Bend.
Jackson	Melrose.	Waukesha	Eagle.
Jefferson	Palmyra.	Waukesha	Pewaukee.
Jefferson	Watertown.	Waupaca	Manawa.
Juneau	Elroy.	Waupaca	Weyauwega.
Juneau	New Lisbon.	Waushara	Hancock.
Kewaunee	Ahnapee.	Winnebago	Neenah.
Kewaunee	Kewaunee.	Winnebago	Omro.
LaCrosse	West Salem.	Wood	Grand Rapids.

Location of Institutes.

Institutes are placed for the most part in localities which show the greatest interest in this movement. Applications for institutes will be received by the superintendent and presented to the agricultural committee at its June meeting. The committee goes over the list and carefully considers the needs and interests of each locality, and places the institutes where in its judgment they will prove the most helpful. Generally there have been far more applications for institutes than it was possible to supply. Applications should be received before June 15, each year.

The Farmers' Institute Bulletin.

To disseminate still more widely a representative portion of the matter presented and discussed at the institutes, and to give it permanency for its own sake and for its historical value, a system of publication in the form of bulletins has been begun by the superintendent. Bulletin No. 7, the last issued, contains a stenographic report of the closing institute held at Fond du Lac in March, 1893. Forty thousand copies of this bulletin have been issued; copies will be sent to all applicants living within the state upon receipt of ten cents to pay postage and mailing.

THE COLLEGE OF LAW

CORPS OF INSTRUCTION.

CHARLES KENDALL ADAMS LL.D., President.

EDWIN EUSTACE BRYANT, Dean of the Faculty, Lecturer on Practice and Pleading, Criminal Law, Personal Property, Railway Law, and the Law of Public Offices and Officers.

ITHAMAR CONKEY SLOAN, Counselor-at-law, Professor of Equity Jurisprudence and Real Property.

JOHN B. CASSODAY, LL.D., Justice of the Supreme Court of Wisconsin, Professor of Constitutional Law and Wills. Lectures and leading cases.

JAIRUS HARVLIN CARPENTER, LL.D., Mortimer Jackson Professor of Contracts.

BURR W. JONES, A.M., LL.B., Professor of the Law of Evidence, Public Corporations, and Domestic Relations.

JOHN MYERS OLIN, A.B., LL.B., Professor of the Law of Wills and Non-Contract Law.

ROBERT MCKEE BASHFORD, A.M., LL.B., Professor of the Law of Private Corporations, and Commercial Law.

ORSAMUS COLE, LL.D., Ex-Chief Justice of the Supreme Court of Wisconsin, Special Lecturer on the Law of Insurance.

GEORGE HENRY NOYES, A.B., LL.B., Counselor-at-Law, Special Lecturer on Common Carriers.

JAMES GRAHAM JENKINS, LL.D., Judge United States Circuit Court, Seventh Judicial Circuit. Special Lecturer on Negligence.

SAMUEL DEXTER HASTINGS, JR., LL.D., Judge of the 4th Judicial Circuit of Wisconsin, Special Lecturer on Taxation.

HENRY BAIRD FAVILL, A.B., M.D., Special Lecturer on Medical Jurisprudence.

GENERAL STATEMENT.

The superior advantages of professional schools, for the training of students in the elementary principles of law and fitting them to enter upon the practice, are now quite generally acknowledged. The recognition by the members of the bar of their merit and superiority over other methods of gaining professional knowl-

edge finds accurate expression in the report of American Bar Association on legal education and admission to the bar, which was unanimously adopted in 1881 by the Association. The report says:

"There is little, if any, dispute now as to the relative merit of education by means of law schools and that to be got by more practical training or apprenticeship as an attorney's clerk. Without disparagement of more practical advantages, the verdict of the best informed is in favor of the schools.

"The benefits which they offer are easily suggested and are of the most superior kind. They afford the student an acquaintance with general principles, difficult, if not impossible, to be otherwise attained; they serve to remove difficulties which are inherent in scientific and technical phraseology; and they, as a necessary consequence, furnish the student with the means for clear conception and accurate and precise expression. They familiarize him with leading cases and the application of them in discussion; they give him the valuable habit of attention, teach him familiar maxims, and offer him the priceless opportunities which result from contact and generous emulation. They lead him to readily survey law as a science, and imbue him with the principles of ethics as its true foundation. Disputing, reasoning, reading, and discussing become his constant exercises."

Among the more important of the advantages afforded to the student by the Law School over the law office or private or solitary pursuit of the study, the following are the most obvious:

1. He is taught to trace the growth, progress and expansion of our body of law. Passing over the obsolete, he learns the actual law of the present time.

2. His studies are directed to give him a comprehensive, general view and analysis of the law as a system.

3. He is well instructed in elementary principles.

4. While studying the substantive law, he is at the same time familiarized with the principles of procedure and general rules of practice, their necessity and application.

5. Having access to large, well-selected libraries he becomes familiar with the literature of the law, learns where to readily find the decisions and the elaborate treatises on special subjects.

6. Constantly examined orally and in writing upon his reading, he becomes more proficient in the expression of his thoughts and knowledge.

7. By constant association, study, discussion, and friendly controversy with fellow students, he acquires self-reliance, overcomes timidity, learns the value of thorough preparation. His mental faculties are quickened and his resources are brought under his command.

The College of Law of the University of Wisconsin, after many years of experience and experiment, offers a course which is believed to be of unusually practical merit, and to give the utmost of valuable and practical instruction and training that can be given in a two years' course of study. The elementary instruction in substantive law usual in all law schools is here fully and carefully given. Less instruction is imparted by means of the lecture alone here than in many schools; and more original work carefully directed is required of the students; and examinations are rigid and conducted daily.

The criticism of lawyers upon law-schools has hitherto been that they gave too little attention to remedial law. The committee on legal education of the American Bar Association in their report for 1891, thus state the very general view of the legal profession: "Almost the only defect in law-school education at the present time which has attracted general attention and remark grows out of the fact that they afford no adequate instruction in matters of practice. It is exceedingly desirable that this defect should be remedied in so far as it is possible to do so. To this end practice courts should be established in all schools of law. It is not enough that what are known as moot courts should be organized for the argument of questions of law. . . . There should be practice courts in which the students should have the opportunity of seeing how everything is done from the commencement of the case to the taking out of execution. . . . The student cannot learn practice by simply listening to a teacher expounding principles of practice; but opportunity must be afforded him for doing himself the things which he will have to do in case of actual ligitation."

The suggestion of this report had been anticipated by this College. The defects criticized had been in good part supplied, and the methods recommended had been substantially adopted some years before this report was made, as will be more fully explained later on in this statement.

METHODS OF INSTRUCTION.

The methods and course of instruction pursued in this College are substantially as follows:

Junior Year.

Fall term.—In Elementary Law, lectures are given, and students assigned reading in various text-books and decisions, to gain clear conceptions of law, its definitions, the sources of the common law, its history, its changes with the advancement of society and the changes in social conditions, its spirit and distinctive features. Its adoption in this country by the English colonists, its extension to the regions west of the Mississippi, its expansion in the American courts are historically traced. In teaching the common law the historical method is so far pursued as to give the student a clear idea of the rules of the common law, their modification by early English statutes, which became part of the common law in this country, the general trend of American legislation in modifying these rules, and, as far as practicable, the reasons existing in our changed conditions for such modifications.

The lectures and studies on elementary law lead to the divisions or classifications under topics into which the work of the several professors is arranged.

Under the topic of the Written or Statute Law, the subject of statutes, their various kinds and the canons of their interpretation, are given, and case-study and exposition by students are required in applying to actual cases the rules of statutory construction.

The Principles of Contracts form the subject of the work of one professor for this term. The subject is so treated as to make all standard text-books helpful. By the use of these and leading cases, as well as notes taken and original work assigned, students are enabled to master the general and settled doctrines as to contracts, their essentials of parties, subject-matter, assent and consideration, legality of object, performance, release, discharge, etc. Practical exercises are had in preparing and drawing contracts of various kinds. The Law of Agency is included in this subject, in the fall term.

Domestic Relations, or the laws regulating the relation of husband and wife, parent and child, master and servant, guardian and ward, are studied in this term. Lectures and examination on text-books and leading cases are given weekly. Under this head the common law as to the status of the wife, the modern equity

doctrines and the legislation known as "Married Womens' Acts," relating to her property rights, are carefully considered.

Criminal Law, or the Law of Crimes, is taken up by text-book studies and weekly examinations on assigned topics. The general principles of the common law of crimes are considered, then each of the crimes defined and punishable by the common law is studied; and such added elements as are commonly found in modern English and American statutes are also noticed. The framing of indictments, complaints, and informations is begun in connection with the subject of each crime. In this work the leading text-books and reported cases are studied.

The Law of Real Property is made an important study. The English common law is carefully mastered, and the part of the English system that enters into and constitutes the basis of American land law is systematically studied, as well for its utility as a mental discipline in legal studies as for its intrinsic importance as actual law.

The Law of Personal Property, embracing chattels, incorporeal personalty and fixtures, the rules applicable to the assignment of incorporeal personal property; the subject of Debts, Debts secured by Lien, or by Pledge and Mortgage of Chattels, Interest and Usury, Copyrights and Patents, Money and Legal Tender, is studied during this term, and two hours weekly are given to examinations and explanation.

Introductory to the studies in remedial law lectures are given on the history and organization of courts in England and America. Following these the elementary law of Jurisdiction of courts is taken up and examinations had weekly. Under this head, the jurisdiction of the Federal Courts, as prescribed by law, is specially examined.

A prominent feature of the work of the Junior Class this term is the Exposition of Cases. Each student is assigned some leading case or line of decisions, germane to the work of the class at the time, and required to write a synopsis of the facts, the decision, and reasoning of the court. From his written statement he orally explains the case or cases to the class. Thus is acquired facility in studying cases, condensing statements, and in expounding the law.

The Class and Faculty Moot Courts meet several times weekly. The Class Moot Court is constituted in several divisions, so that each student is frequently assigned cases. The Faculty Moot Court gives each student opportunity to prepare and argue a case

on a submitted statement of facts as often as twice each term. As the class advances in studies in procedure the cases are conducted in conformity to common-law practice and pleading.

Common-law Pleading is studied; and examinations based on Chitty, Stephen and Gould are had, and the drafting of pleadings on submitted cases is practiced. *Two hours a week.*

Written examinations on all studies at the close of the term.

Winter term.— This term is devoted to Real Property, specially treating the subjects of Estates for Years at Will, and by Sufferance; License; Estates in Joint Tenancy, Entirety, in Common and Severalty; Estates upon Condition, Mortgages and Incorporeal Hereditaments. *Two hours a week.*

In the Law of Contracts the special topics are Bailment, Partnership and Common Carriers. *One hour a week.*

In Personal Property the subjects of Title by Occupancy, Accession, by Gifts *inter vivos* and *causa mortis*, and the Law of Sales and Warranty are made special topics for text-book and case study and examination. *Two hours a week.*

The subject of Criminal-Law is continued and procedure considered; the rules of criminal pleading, the preparation of indictments, pleas, and all the steps in a criminal prosecution are studied and exemplified in class work, in exercises and moot courts. *Two hours a week.*

The Law of Public Offices and Officers is treated by lectures and examination of cases, with Mechem and Throop as text books. *One hour a week.*

Municipal Corporations are made the work of one professor; and lectures and examinations on Dillon's treatise are had each week. *One hour.*

Written examination at the close of term.

Spring term.— Real Property continued. *Two hours a week.* Personal Property completed, embracing remedial law, the Statute of Frauds, etc. *Two hours per week.* The Law of Contracts continued, especially considering remedial law for breach and the defenses in actions and suits arising out of contract. *One hour a week.*

The work in Criminal Law is finished, being principally procedure and evidence in criminal cases. *One hour a week.*

Public Offices and Officers continued, including the law and practice in Mandamus and Quo Warranto. *One hour a week.*

Common-law Pleading and Practice completed. Then Pleading and Practice in Equity in the Federal Courts are studied and proceedings conducted, such as drafting bills, demurrers, pleas, answers, exceptions, the taking of testimony, hearings and entry of interlocutory decrees, accounting before masters and entry of final decrees, issuing injunctions, etc. *Two hours a week.*

Municipal Corporations completed. *One hour a week.*

Exercises and moot court work continued, and students assigned special topics for examination and exposition.

Written examination at close of term.

Senior Year.

Fall term.—Constitutional Law; lectures, study of cases, and examinations and written report each week by each student on some leading case. *One hour a week.*

Remedial Rights; examination and text-book and case study. *One hour a week.*

The Law of Evidence; examinations, lectures, and case and text-book study. *One hour a week.*

Code Practice; lectures, study of codes, and examinations. *Two hours a week.* Students are required to prepare various papers which are examined, criticised and errors pointed out.

The Law of Wills; text-book study, examinations, reports in writing on leading cases. *One hour a week.*

Code Pleading, with practical exercises. *Two hours a week.*

The Law of Railways; lectures, examinations, and study of special cases. *One hour a week.*

Equity Jurisprudence; examinations in leading text-books. *One hour a week.*

Real Property; the law of Uses, Trusts, and Remainders. *One hour a week.*

Written examinations in all studies at the end of the term.

Class and Faculty Moot Court work during the term.

Winter term.—Constitutional Law; lectures, examinations, and written reports of leading cases continued. *One hour a week.*

The Law of Evidence, continued; lectures, text-book examination, and study of selected cases. *One hour a week.*

Code Practice; lectures, code study and examination, and practical work in Ordinary Actions, Extraordinary Remedies and Equitable Actions. *One hour a week.*

Code Pleading; studies from Pomeroy, Maxwell, Bliss, and Bryant. *One hour a week.*

Railway Laws; lectures and examinations concluded. *One hour a week.*

Practice in Justice's Court, with practical exercises. *One hour a week.*

Equity Jurisprudence, continued. *One hour a week.*

The Law of Private Corporations; lectures and text-book study with examinations. *One hour a week.*

The Law of Torts; text book study, reports on selected cases, and examinations. *One hour a week.*

Commercial Law; lectures, text-book and case-studies and examinations. *One hour a week.*

Written examinations at the end of the term in all studies.

Class and Faculty Moot Court work during the term.

Spring Term.—Constitutional Law concluded. Reviews and examination. *One hour a week.*

The Law of Evidence concluded. Reviews and examinations. *One hour a week.*

The Law of Torts or Non-Contract Law concluded. *One hour a week.*

The Law of Private Corporations concluded. Reviews and examinations. *One hour a week.*

The Administration of Estates with practical exercises. *One hour a week.*

Practice on Writs of Error and Appeals; Creditors' Suits and Supplementary Proceedings. *One hour a week.*

Commercial Law concluded. *One hour a week.*

Real Property concluded. *One hour for six weeks.*

Eminent Domain; lectures, text book, and case study. *One hour weekly for six weeks.*

Special lectures: Common Carriers, Insurance; Damages; Taxation, and other topics.

Lectures and Instructions in General Practice. *One hour a week.*

The course pursued as above indicated is much commended by jurists for its practical character; and the success which has attended so large a per cent. of those who have graduated from this

College, and the facility with which they enter upon practice, and their advancement in it, have elicited the commendation of courts very generally, and attest the practical utility of the methods and courses of study here pursued. It is not claimed, nor can it be expected, that a student can become a thoroughly equipped lawyer in two years in any school or under any system; but he can gain a comprehensive general knowledge of the elementary principles of law, and can learn, along with the substantive law, much of the adjective law of procedure. Best of all he learns how to study law, where to find it, the best method of legal study, analysis, and reasoning. It is the aim of the instructors here to make the student self-reliant and capable of pursuing legal investigation on original work, and to trace the law from its original sources to its present state.

RESOURCES OF THE COLLEGE OF LAW.

The Board of Regents annually make an appropriation for the support of this College. The matriculation fees charged for its course constitute only a part of the resources by which it is maintained.

By the generous provisions of the will of the late Judge Mortimer M. Jackson, funds to the amount of twenty thousand dollars were bequeathed to the University to found and maintain a Professorship of Law. In accordance with the wish of the donor, Judge J. H Carpenter, an instructor of long experience and well-recognized ability, has been elected to this professorship. The act of 1891 by which the legislature provided for the erection of the building for the College provided also for its equipment; and as fast as this appropriation can be realized, the library will be enlarged, and the appointments of the College kept up to maintain it in the greatest utility.

TERMS OF ADMISSION.

The lawyer, unless endowed with great native vigor of mind, can not take high rank in his profession, unless he has a liberal education. His culture should be broad. He should have a mastery of the English language, familiarity with its literature; and he should be versed in history and in civil, economic and social science. A college or a university course as a preparatory to professional study is very desirable. His professional work often requires that the lawyer become familiar with some specialties of

the science of other professions and avocations than his own. His early training should be such as to enable him to readily master them when occasion requires.

Preliminary Course.

It is urged upon all those whose general education is not ample, to take a preliminary course of study in those branches which are most nearly related to law and most serviceable in legal practice, before entering upon the strictly professional course. To facilitate this, adult students, who give evidences of being able to take up branches advantageously, and minors above eighteen years of age, who pass a satisfactory examination in the above studies, will be permitted to take up a select course framed from the following branches: Elementary law, History, Economics, Political Science, English literature, Rhetoric, Elocution and Legal Latin.

It is the policy of the University to raise the standard of admission to the College of Law as far as consistent with existing educational conditions.

Applicants for admission to the Law Course will be examined in:

1. English language, testing their ability to read and write correctly, and express ideas accurately.

2. American and general history, as a knowledge of law, its growth and changes involves knowledge of the history of the law and of civilization generally.

3. The constitution of the United States and the general features of the constitutions of the States.

4. English literature, to ascertain the extent of his reading and the accuracy and clearness of his memory and understanding of the books he has read.

Unless the student has a good, general English education, as the term is used, he should not enter upon a two years' course in the study of law.

Candidates will be admitted without examination upon presenting certificates of graduation from any reputable college or university, State normal school, accredited high school or academy, or upon presenting a first grade teacher's certificate.

Admission to Advanced Standing.

Candidates presenting duly accredited certificates from other law schools of good standing will be admitted to corresponding standing in this college without passing examinations. In such

studies or topics as they have not had in the other schools, which have been passed in the course here when they join, special classes will be formed to enable them to bring up their work and pass examination.

Students entering the Junior class after the beginning of the academic year, will be required to read and pass examination in the work of the class which has been done prior to their admission. It is urged upon all who desire to enter the classes, to begin at the opening of the fall term, as the disadvantage of entering a class some weeks after it is organized and well advanced in studies is one that hampers the late-coming student through his whole course.

Three Years' Course.

A three years' course is offered, consisting of an extension of the professional studies of the two years' course given above conjoined with elective studies in economics, political and social science and advanced literary branches. When studies in these elective branches equivalent to a year's work are taken by graduates of college courses, it will entitle them to the academic Master's degree as well as the degree of Bachelor of Law, when other required conditions are fulfilled. This three year's course constitutes, to such, at once a professional and a graduate course of study. It is strongly recommended.

SPECIAL ADVANTAGES.

The peculiar advantages which the city of Madison affords to the law student are equal, and in many respects superior, to any to be found in any place where a law school is established in this country. The principal of these are the following:

Courts.

The Supreme Court of the state is in session during the most of the academic year; and students have opportunity to listen to carefully prepared arguments by the most able lawyers of the state.

Two terms of the United States Circuit and District Courts are held here annually, and important cases are there tried, both in the law side of the court before juries and in equity causes, illustrating the procedure in the Federal Courts.

The Circuit Court for Dane County holds three terms each year, giving the student excellent opportunity to learn the meth-

ods and practice under the Code system, which is substantially like that in twenty-seven states and territories.

The Municipal Court of Dane County sits daily for the trial of criminal cases. Nowhere are better facilities conveniently at hand for becoming familiar with the practice in courts and the methods pursued by able and successful practitioners.

The Legislature

of the state holds one session during each course, enabling students to observe the processes of legislation.

The University.

The University of Wisconsin is conceded to rank among the best and most advanced institutions of learning in the Union. It is admirably equipped, and has a corps of instructors selected from the best scholars in their respective specialties. The site of the University buildings is one of the most beautiful places in the country. Large sums have been and are being expended in buildings, libraries and apparatus in all the departments. The attendance of students from the best youth of the country is large and steadily increasing. The student of the College of Law is surrounded by the best influences. He is not only in a "legal atmosphere," but his associations are with those who, in other lines of study, are striving to attain excellence.

Law College Building.

The liberality of the State has provided the means and the Regents have erected a building for the College of Law, which it now occupies. The edifice is one of the finest and most convenient possessed by any law school in the country. It is located on the campus or University ground, convenient of access and on a commanding site. A stately structure, elegant in design and finish built of the brown sand stone of Lake Superior, at a cost of over $80,000, it is designed especially to be convenient for the uses of the College. Its lecture rooms and library are large, capable of comfortably seating several hundred students. The most approved systems of lighting, heating and ventilating, and the most convenient appliances for writing or taking notes, are furnished. Rooms for moot courts and class debates are, also, provided.

The School of Economics, Political Science, and History,

under the direction of Dr. Richard T. Ely, with an able corps of instructors and special lecturers, is established in other rooms of

the same building. Students of the College of Law are enabled, if they desire to do so, to pursue the studies of this school and attend lectures upon Political Economy, Institutional History, Constitutional and International Law, Civil Polity and American History, and special lectures on such topics as the Distribution of Wealth, Socialism, Taxation, Government of Cities, Pauperism, Criminology, Public Finance, Economics of Agriculture, and various other topics ably treated by advanced teachers and thinkers on these and similar topics. These subjects are of especial importance and value to the student of American law, and add greatly to the advantages of the College of Law, giving its students especially convenient facilities for including the economic studies in their course.

Libraries.

The College of Law has a fine and steadily increasing library of the best of law books and reports. This is expected to be soon greatly enlarged. It is open for the use of law students during the day and evening.

The law library of the state, the largest and most complete in the northwest, is located in the Capitol building; and students of the College of Law are permitted to use its books for reference and conveniences are afforded them for the use of the books in preparing briefs or pursuing topical investigations.

The Library of the State Historical Society, with over 98,000 volumes and 69,000 pamphlets, a collection of books of the greatest value in historical study and research, is open to students of the University.

The General University Library, including the department libraries catalogued with it, contains about 30,000 books and 8,000 pamphlets, and is open every week-day to students. About two hundred of the best American and foreign periodicals are taken and kept on the files for students' use.

The Bar.

The bar of Dane county is reputed an unusually strong one. It is especially noted for the thoroughness of its members in preparing their cases for trial, and for its accurate and precise methods in practice. Students who desire it can generally obtain situations in law offices, where they have opportunities to assist in practice, in the preparation of briefs and in the conduct of legal business, at the same time attending lectures and the practical exercises of the class.

INSTRUCTION IN ELOCUTION AND ORATORY.

Special instruction in Elocution and Oratory is given to the law students, as follows:

Fall Term.— Elocution and Oratory. (*a*) Voice training for effective quality, reading, declamation and gesture exercises. Lectures on vocal physiology, and on the use and care of the voice. *Twice a week.*

Winter Term.— (*b*) Special drill on reading statutes and other documents before a court or jury. Practice in declamation and extempore speaking. Lectures upon the origin, meaning, and principles of gesture.

EXAMINATION FOR ADMISSION.

The examination for admission will be made on the day preceding the opening day of the fall term. Those intending to apply for admission should notify the Dean before the commencement of the term, and apply for directions, as examinations cannot be had after the commencement of the term. No student of the Junior year will be admitted to the Senior class who fails to pass an examination in the principal studies of the Junior year, except conditionally; his graduation being dependent upon his attaining proficiency during the year in the studies wherein he was found deficient.

Students applying for admission, upon examination, to the Senior class, must report in person for examination two days before the commencement of the term; as the examination will occupy three days and cannot be held after the appointed time.

EXAMINATION FOR GRADUATION.

For graduation each student will be required to have passed a satisfactory examination upon all studies pursued during both years of the course; such examinations to be made either at the end of each term or year, or on completion of a particular topic; and he must have prosecuted or defended to judgment such moot court cases as shall have been assigned by the Faculty, making a complete record of the case. He must also have prepared such legal papers, pleadings, etc., as have been assigned for practice; and at least one month before the close of the Senior academic

year must have prepared and submitted to the Dean, a satisfactory thesis upon some legal topic, to be examined, criticised, and marked by some member of the Faculty.

ADMISSION TO THE SENIOR CLASS.

Candidates who have studied elsewhere, and can pass examination upon the studies of the Junior year, or their equivalent, can enter the Senior year. But such examination will be most searching and thorough, embracing all the studies of the Junior year except Common Law Pleading, and Pleading and Practice in Equity and Criminal Law, in which special classes will enable them to go over those topics. The examinations will be chiefly in writing, extending over all the topics of the Junior year, except as above indicated, and occupying three days.

As the real ground-work of legal proficiency is laid in the first year's course, all should strive to take it rather than trust to such progress as can be made in a law office or reading in private. If but one year can be spent at a law school, the first year will be the most valuable. The student can, upon the proficiency thus gained, be admitted to the bar upon examination by the state board of examination for admission to the bar, and, in his future studies, have the benefit of the elementary training of the first year.

TEXT-BOOKS.

Among the text-books used as the ground-work or basis of examination are:

Adams on Equity; Beach on the Law of Railways; Benjamin on Sales; Bishop on Contracts; Bigelow on Torts; Bigelow on Bills and Notes; Bishop on Non-Contract Law; Bishop on Criminal Law; Bliss on Pleading; Bryant on Code Pleading; Cassoday on Wills; Cook on Stock, etc.; Cooley on Torts; Cooley on Constitutional Limitations; Darlington on Personal Property; Dillon on Municipal Corporations; Edwards on Bills of Exchange and Promissory Notes; Gould on Pleading; Greenleaf on Evidence; Langdell on Equity Pleading; Heard on Civil Pleading; Heard on Criminal Pleading; Jones on Evidence; Lawson on Contracts; Lewis on Eminent Domain; Maxwell on Pleading; Mechem on Agency; Mills on Eminent Domain; Morawetz on Private Corporations; Parsons on Contracts; Pomeroy's Equity Jurisprudence; Pomeroy's Remedies and Remedial Rights; Redfield on Wills;

Rorer on Railroads; Schouler on Domestic Relations; Schouler on Personal Property; Schouler on Wills; Smith on Personal Property; Stephen on Pleading; Story on Agency; Story on Equity Pleading; Story on Partnership; Tiedeman on Commercial Paper; Tiedeman on Real Property; Tiedeman on Sales; Tiedeman on Equity Jurisprudence; Wade on Law of Notice; Washburn's Outlines of Criminal Law; Washburn on Real Property; Willard's Equity Jurisprudence; Williams on Real Property.

The books mentioned in the following list may be used to advantage:

BAILMENTS.—Edwards, Schouler, Story.

BILL, NOTES, AND COMMERCIAL PAPER.—Byles, Chalmers, Daniel, Parsons, Randolph, Story, Bigelow and Norton.

COMMON CARRIERS.—Hutchinson, Redfield on Railways; Thompson on Passenger Carriers; Noyes' Lectures.

CONSTITUTIONAL HISTORY.—Hallam's Constitutional History of England (1485-1760); May's Constitutional History of England (1760–1870); Young's Constitutional History of England (1760–1860); Bagehot's English Constitution; Fischel's English Constitution; Cox's English Institutions; Curtis' History of the Constitution of the United States; Bancroft's History of the Constitution of the United States; Von Holst's Constitutional History of the United States.

WILLS AND ADMINISTRATION.—Redfield on Wills; Jarman on Wills; Williams on Executors; Woerner's American Law of Administration; Schouler on Wills.

CONSTITUTIONAL AND STATUTE LAW. Cooley's Principles of Constitutional Law; Endlich on Interpretation; Story's Commentaries on the Constitution of the United States; Sedgwick on Constitutional and Statutory Law; Jameson's Constitutional Counselor; Bishop's Written Law; Maxwell on the Interpretation of Statutes.

CONTRACTS.—Anson, Benjamin, Bishop, Metcalf, Parsons, Pollock,

CORPORATIONS.—Angell and Ames, Field, Morawetz, Taylor, Dillon on Municipal Corporations; Thompson on Liability of Stockholders; Cook on Stock and Stockholders; Beach on Corporations.

CRIMINAL LAW.—Bishop, Wharton, Harris, May, Stephen's Digest of Criminal Law.

DOMESTIC RELATIONS.—Reeves, Bishop on Marriage and Divorce; Bishop on Married Women; Cord on Married Women; MacDon-

nell on Master and Servant; Ewell on Infancy; Tyler on Infancy; Schouler's Domestic Relations.

EASEMENTS.—Goddard, Washburn.

EQUITY.—Pomeroy or Story's Equity Jurisprudence; Adams' Equity; Bispham's Principles of Equity, Beach on Equity Jurisprudence.

ESTOPPEL.—Bigelow, Hermann.

EVIDENCE.—Best's Principles of Evidence; Stephen's Digest of the Law of Evidence; Wharton, Starkie, Rogers on Expert Testimony.

INSURANCE.—May on Insurance; Wood on Fire Insurance; Bliss on Life Insurance; Arnould on Marine Insurance; Richards on Insurance.

INTERNATIONAL LAW.—Wheaton's Elements of International Law; Phillimore's International Law; Woolsey's Introduction to International Law; Hall's International Law; Story's Conflict of Laws; Wharton's Conflict of Laws.

JURISPRUDENCE.—Holland's Elements of Jurisprudence; Austin's Lectures on Jurisprudence; Lorimer's Principles of Jurisprudence, Ames on the Science of Law; Curtis' Jurisdiction of United States Courts.

MINERAL LAWS.—Weeks.

PARTNERSHIP.—Lindley, Parsons, Story, Tyler, Pollock.

PLEADING.—Gould, Chitty, Bliss on Code Pleading; Story's Equity Pleading; Barton's Suit in Equity; Maxwell on Code Pleading, Bryant on Code Pleading.

RAILWAYS.—Beach, Rorer, Redfield, Hutchinson on Carriers.

REAL PROPERTY.—Boone, Williams, Tiedeman.

REPLEVIN.—Corbin.

SALES.—Benjamin, Tiedeman, Smith.

SHIPPING AND ADMIRALTY.—Abbot, Conklin, Desty, Parsons.

TAXATION.—Blackwell, Burroughs, Cooley, Desty.

TORTS.—Addison, Ames, Hilliard, Moak, Weeks, and Bishop on Non-Contract Law.

Students, who are able to do so, will find it to their advantage to furnish their own books. They will need them in practice and can hardly afford to be without them during their course. Ar-

rangements have been made by which they can be ordered through the secretary of the Board of Regents, and obtained at a considerable discount from quoted prices. It is believed that the books required for the first year can be obtained for about sixty dollars; for the second year, for about seventy-five dollars. The law library has several copies of the text books most used, for the use of students who are unable to buy their own.

EXPENSES, ETC.

The matriculation fee for the full course is $100, two-thirds of which must be paid at the opening of the first year, and one-third at the opening of the second year. For students entering the Senior class for a one years' course the fee is $75.

All fees are payable in advance at the office of the Secretary of the Board of Regents, College of Law. Not less than $100 shall be charged for a two years' course, nor less than $75 for one year's course.

No deduction will be made for absences, nor extension of time of payment of fees granted.

The expenses of living are moderate. Good board can be obtained at from $3 to $4 per week, and by forming or joining clubs the expenses can be reduced. Students desiring information in regard to boarding places, or general information as to expenses, should address their inquiries to the Secretary of the Board of Regents, Madison, Wisconsin. A careful perusal of this General Statement it is believed will supply all needed information; but should further inquiry as to admission, examination, etc., be necessary, it should be addressed to The Dean of the Law Faculty, Madison, Wisconsin.

SOCIETIES.

The E. G. Ryan Literary Society, the Forum, and the Columbian are three incorporated literary societies, composed entirely of law students. Each of them is in flourishing condition; and each holds weekly meetings in one of the rooms of the college for debates and other literary exercises. Opportunity is afforded to each student frequently to take part in debate.

CALENDAR.

WINTER TERM opens Monday, January 8, 1894.
First Lecture, Tuesday morning, January 9.
Legal Holiday, Thursday, February 22.
Winter Term closes Friday, March 30.
Spring vacation, March 31 — April 9.

SPRING TERM opens Monday, April 9.
First Lecture, Tuesday, April 10.
Spring Term closes Wednesday, June 20.
Summer Vacation, June 20 — September 12.

FALL TERM opens Wednesday, September 12, 1894.
First Lecture, Thursday afternoon, September 13.
Thanksgiving Recess, November 29 — December 3.
Fall Term Closes, Friday, December 22.
Christmas Vacation, December 22, January 7, 1895.

For further information address Dean of Law Faculty, Madison, Wisconsin.

SCHOOL OF ECONOMICS, POLITICAL SCIENCE, AND HISTORY.

CORPS OF INSTRUCTION.

CHARLES KENDALL ADAMS, LL.D., President of the University.
RICHARD T. ELY, PH.D., LL.D., Director, and Professor of Political Economy.
JOHN B. PARKINSON, A.M., Professor of Constitutional and International Law.
FREDERICK J. TURNER, PH.D., Professor of American History.
CHARLES H. HASKINS, PH.D., Professor of Institutional History.
WILLIAM A. SCOTT, PH.D., Associate Professor of Political Economy.
VICTOR COFFIN, PH.D., Assistant Professor of European History.
HENRY H. SWAIN, A.B., Fellow in Economics.
CHARLES M. HUBBARD, A.B., Fellow in Finance.
ORIN G. LIBBY, B.L., Fellow in History.
FRANK L. VAN CLEEF, PH.D., Special Lecturer on The Finances of the Ancient Greeks.
PHILIP W. AYRES, PH.D., Special Lecturer on Pauperism.
DAVID KINLEY, PH.D., Special Lecturer on Money and Banking.
HARRY J. FURBER, JR., PH.D., Special Lecturer on The History of American Economics.
FRANK C. SHARP, PH.D., Special Lecturer on Social Ethics.

GENERAL STATEMENT.

The purpose of the school is to afford superior means for systematic and thorough study in economics, political and social science, and history. The courses are graded and arranged so as to meet the wants of students in the various stages of their progress, beginning with the elementary and proceeding to the most advanced work. They are also designed to meet the wants of different classes of students; as, for instance, those who wish to enter the public service, the professions of law, journalism, the ministry or teaching, of those who wish to supplement their legal, theological, or other professional studies with courses in social

science or history. Capable students are encouraged to undertake original investigations, and assistance is given them in the prosecution of such work through seminaries and the personal guidance of instructors. A means for the publication of the results of investigations of merit and importance is provided in the University studies, the expense of which is met by the state.

The leading features of the school are as follows:

I. The Regular Courses of Instruction.

These are described in detail on pages 67–73.

II. The Historical and Political Science Association.

This is a semi-public institution, and includes in addition to students such other qualified persons as are elected to membership. It meets monthly in the Seminary Room in the Law Building. The program for the year 1893–94 includes a paper on The University Settlement Idea by Dr. F. C. Sharp, of the University of Wisconsin; on Assessment Life Insurance by Dr. E. W. Bemis, of the University of Chicago; on The Problem of the Poor in Great Cities by Dr. P. W. Ayres of Cincinnati; on Canadian Politics by Dr. Victor Coffin, of the University of Wisconsin; on the English Home Rule Bill by President Adams; on The Social Office of Force by Dr. Richard T. Ely, of the University of Wisconsin; on The Frontier in American History by Dr F. J. Turner, of the University of Wisconsin; and on Citizenship and Suffrage by Hon. Horace Rublee of Milwaukee.

III. Special Lecture Courses.

The program of special lectures for the year 1893-94 is as follows: (1) A course on The Problem of the Poor in Great Cities by Doctor Phillip W. Ayres of Cincinnati; (2) a course on the Finances of the Ancient Greeks by Professor Frank L. Van Cleef, of the University of Wisconsin; (3) a course on Money and Banking by Professor David Kinley, of the University of Illinois; and (4) a course on the History of American Economics by Professor Harry J. Furber, of Northwestern University.

SCHOOL OF PHARMACY.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL.D., President of the University.
EDWARD KREMERS, PH.G., PH.D., Professor of Pharmaceutical Chemistry.
CHARLES R. BARNES, PH.D., Professor of Botany.
EDWARD A. BIRGE, PH. D., Professor of Zoology.
JULIUS M. CLEMENTS, PH.D., Asssistant Professor of Geology.
WILLIAM W. DANIELLS, M.S., Professor of Chemistry.
DAVID B. FRANKENBURGER, A.M., Professor of Rhetoric and Oratory.
ALMAH J. FRISBY, B.S., M.D., Professor of Hygiene and Sanitary Science.
HOMER W. HILLYER, PH.D., Assistant Professor of Organic Chemistry.
WILLIAM H. HOBBS, PH.D , Assistant Professor of Mineralogy and Petrology.
EDWARD T. OWEN, A.B., Professor of French Language and Literature.
WILLIAM H. ROSENSTENGEL, A.M., Professor of German Language and Literature.
HARRY L. RUSSELL, PH.D., Assistant Professor of Bacteriology.
CHARLES S. SLICHTER, M.S., Professor of Applied Mathematics.
BENJAMIN F. SNOW, PH.D., Professor of Physics.
CHARLES R. VAN HISE, PH.D., Professor of Geology.
CHARLES A. VAN VELZER, PH.D., Professor of Mathematics.
DUNCAN ANDERSON, B.S., Assistant in Chemistry.
LOUIS W. AUSTIN, PH.D., Instructor in Physics.
LELLEN S. CHENEY, B.S., Instructor in General and Pharmaceutical Botany.
LOUIS KAHLENBERG, M. S., Instructor in Chemistry.
WILLIAM S. MARSHALL, PH.D., Instructor in Biology.
WILLIAM S. MILLER, M. D., Instructor in Vertebrate Anatomy.
LEOPOLD C. URBAN, PH.G., Assistant in Pharmaceutical Chemistry.

Instructors in Practical Pharmacy and Pharmacognosy will be appointed.

GENERAL STATEMENT.

It is the good fortune of the School of Pharmacy to be able to announce a decided improvement in its course. The object of the course has been and still is to lay as thorough a scientific foundation as time and means will permit for the pursuit of the profession of pharmacy. The elements of chemistry, botany, and physics must first be studied before their application to pharmacy can rationally be considered. This is as true for pharmacy as for any other applied science or art. Any other process must tend toward superficialty. The course, therefore, provides for a year's work in general chemistry to be followed by another year's work in pharmaceutical chemistry; also for general botany to be followed by the study of the morphology and anatomy of vegetable drugs. In the general studies the students have the opportunity of close association with students from other courses, all of whom pursue the same elementary study to be followed later by more specialized studies in the various departments. While studying the applied sides of the respective sciences the students associate in class-room with those who are seeking the same preparation and work in laboratories especially equipped for those particular branches of the sciences to be pursued.

The course of study in pharmacy will hereafter be so extended as to include practical pharmacy, and will provide also for a more thorough study of pharmacognosy. A special laboratory and dispensing room will be equipped for efficient study of and training in practical pharmacy under a special instructor. The work will be that of a model pharmacy in so far as such conditions can be reproduced in a university laboratory and dispen sary. An outline of this work is given on pages 191–197.

Whenever possible, students are recommended to take three years for the studies of the short course. This will relieve them of some of the sciences in the first year and permit them to take such studies as German, French, or mathematics, which will enable them to pursue their advanced scientific studies more satisfactorily. Familiarity with the German language is of particular importance, since a large percentage of scientific reference books and journals are written in that language and have not been translated. In this state of Wisconsin, too, a knowledge of the German language may also prove of great practical benefit after leaving the University. This extension of time will also permit the student to elect later in the course such other studies as he may desire, as physiology or bacteriology. In this respect the

student enjoys unusual advantages, since most of the departments of instruction of the University are open to him.

Students desiring to prepare themselves as chemists for manufacturing establishments or as analytical or sanitary chemists can do so by adding a year to their course, and electing those studies which have direct bearing on the line of work they desire to pursue in after life.

Special attention is also called to the Four Years' Course offered to graduates of accredited high schools. This course was created in order to accomodate those students who desire to obtain a general scientific education and to include in their course the pharmaceutical studies, and with the hope of stimulating a broader pharmaceutial education.

Information about studies in the Four Years' Course and in the College of Science and Letters can be found elsewhere in the University catalogue, which can be obtained from Mr. E. F. Riley, Secretary of the Board of Regents; or from the registrar of the University, Mr. W. D. Hiestand.

The School of Pharmacy is an integral part of the University and is governed by the same general policy that characterizes the institution. The methods of work differ in no essential from those adopted by the other scientific departments. This School has from the beginning demanded a large amount of laboratory instruction, believing that none of the natural sciences can be adequately taught without considerable instruction in the laboratory, or whenever necessary, in the field.

LABORATORIES.

The Chemical Laboratories, six in number, are in a buildin g devoted exclusively to Chemistry. Three of these are general laboratories, viz.:

First. The Qualitative Laboratory, with accommodations for ninety-six students.

Second. The Organic Laboratory, accommodating thirty-two students; and,

Third. The Quantitative Laboratory, accommodating forty-eight students.

Of the three special laboratories, one is for Gas-analysis, one for Urine-analysis, and one for Toxicology.

Pharmaceutical Chemical Laboratories. These are located on the third floor of North Hall. They afford ample accommodation to the second year students. Every student is assigned a desk which he alone uses. The balance-room is well equipped with Becker's and Sartorius' balances, a torsion balance, etc. A Bunsen combustion furnace, a Glazer combustion furnace with the latest improvements after Anschütz and Kekulé, a Kopfer combustion furnace for compounds rich in halogen, a Kekulé gas furnace for heating substances in sealed tubes, nitrometers, a Geissler vaporimeter for the determination of alcohol, a polariscope from Schmidt & Haentsch, a total refractometer for chemists after Pulfrich, a specific gravity balance after Westphal, and many other chemical and physical apparatus can be used by the student particularly in the experimental work for his thesis.

Biological Laboratories. These are on the third floor of Science Hall.—The elementary laboratory for the departments of botany and zoology is arranged to accomodate 72 students, and is provided with compound microscopes, dissecting microscopes, and other apparatus necessary to an elementary course in botany and zoology. The departments have about 80 compound microscopes, chiefly by Leitz and Bausch & Lomb, fitted for elementary and advanced work, including seven microscopes furnished with oil immersion objectives.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to an advanced course in vegetable histology, and to a course in vegetable physiology.

There are also laboratories for advanced work in zoology and histology, and a well-equipped bacteriological laboratory. The latter is in Agricultural Hall.

Pharmacognostical Laboratory. This laboratory is situated on the fourth floor of North Hall. Besides a place at the working table each student is furnished a series of drawers for the arrangement and storage of his collection of vegetable drugs. In the same room is kept for reference the standard working collection of drugs of the department.

The Pharmaceutical Laboratory and Dispensary, North Hall. A laboratory for practical pharmacy will be equipped with the necessary apparatus and appliances. A considerable amount of apparatus is already on hand, which will be placed so as to be of greater use to the student.

Mineralogical Laboratory. The Mineralogical Laboratory has reagents and other necessary apparatus for complete courses in

blow-pipe analysis and determinative mineralogy. There is a collection of hand specimens of minerals for laboratory use, and for comparative purposes. The students also have access to the large collections in the cabinet.

The Assay Laboratory, situated in the south part of the basement of the chemical building, is one of the largest and best equipped laboratories of its kind in the country. A more detailed description of these laboratories as well as of the petrological, psychological, and the various agricultural laboratories, will be found in the general catalogue of the University, College of Science and Letters, and College of Agriculture.

THE PHARMACEUTICAL MUSEUM.

The recent additions to the pharmaceutical collections have necessitated their entire rearrangement. New cabinets are being constructed, and better containers and a large number of illustrations have been purchased. It is hoped that by the close of this academic year, the work of arrangement will be completed in large part at least.

The chemical collection contains: 1. Cabinet specimens of chemicals and minerals. The latter serve not only to supplement our knowledge of manufactured chemicals, but also to demonstrate the occurrence in nature of chemical elements and their compounds, also to illustrate in many instances, the source of many artificial chemicals. Through the liberality of the United Alkali Company of England, some 50 odd specimens of their products in various stages of manufacture have been added recently. 2. Chemical apparatus for the illustration of chemical operations and processes. 3. There are charts illustrating chemical processes of manufacture, curves of solubility of classes of salts, chemical apparatus, etc.

The pharmacognostical collection has been very largely increased by purchases made at the World's Fair, the recent acquisitions consisting chiefly of drugs of Asiatic origin. Notable among them are a collection of fifty Ceylon drugs and medicines, and a collection of more than 100 Malay medicines. Worthy of mention are also a collection of 122 handsome specimens of essential oils and allied synthetic products, the liberal donation of Messrs. Schimmel & Co., of Leipzig, Germany; a collection of choice drugs fro m Messrs. Lehn & Fink, a materia medica cabinet from Parke, Davis & Co., etc.

A collection of objects of historical interest has been begun, and valuable contributions have been received from students and from several druggists of this state.

The biological and the mineralogical and geological museums in Science Hall are well equipped and full of interest to the student of the natural sciences.

LIBRARIES.

The General University Library, including the department libraries catalogued therewith, contains about 30,000 books and 8,000 pamphlets. It is open to students every day from 8:45 A. M. to 6 P. M., excepting on legal holidays and Sundays. About 200 of the best American and foreign periodicals are taken.

The several scientific departments have special library facilities. The chemical and pharmaceutical laboratories have their department libraries easily accessible to the laboratory student. Complete sets of several of the best chemical and pharmaceutical journals and of proceedings of associations have been purchased in recent years. Contemporary pharmaceutical literature is well represented in the reading room.

Students also have access to the State Historical Library, numbering about 165,000 volumes, including pamphlets, and by special arrangements books may be obtained from the free library of the city of Madison, which is a well-selected collection of over 13,000 volumes.

TERMS OF ADMISSION.

To the Two Years' Course.

All applicants must be at least eighteen years of age.

Applicants who bring a certificate of at least one year's attendance from some standard high school, or its equivalent from a similar educational institution, will be admitted without further examination.

All other applicants who do not present written evidence of a satisfactory preliminary education will be subjected to such an examination in arithmetic, grammar, English composition, geography (political and physical), and history of the United States, as will afford a guaranty that the applicant is capable of pursuing with advantage and profit to himself the studies of this course. The examination of such applicants will be held on the first two days immediately preceding the opening of the fall term.

Applicants who desire to enter under the above-mentioned conditions should previously have had two years' practical experience in a well-conducted pharmacy. If possible, they should acquire before coming to the University a knowledge of high school mathematics and physics. Although these studies are not obligatory they cannot be too urgently recommended. Graduates from accredited high schools will be admitted without previous practical experience. For the list of accredited schools, see page 46 of the general catalogue.

To the Four Years' Course.

The terms of admission to this course are the same as those to the General Science Course, as given on page 43 of the general catalogue. No practical experience in pharmacy is required.

Students from other colleges or schools of pharmacy will be admitted on presentation of satisfactory certificates. However, no student who enters from another college will be admitted after October 1, of the year in which he intends to graduate.

DEGREES.

The following are the requirements for the degree of *Graduate in Pharmacy* (PH.G.).

The candidate must have satisfactorily completed the studies of the Two-years' Course.

He must have had four years of professional experience. The time spent at the University is considered as part of such time of experience.

He must have passed satisfactorily the examination in practical pharmacy held by the examining committee of the State Pharmaceutical Association. Only those students who have had the required practical experience are admitted to this examination.

He must have attained the age of twenty-one years.

Upon presentation of this diploma, graduates in pharmacy can obtain, without further examination, the graduate certificate from the State Board, which permits the independent practice of pharmacy in the State of Wisconsin.

Any *Graduate in Pharmacy* of this school, in good professional standing, may become a candidate for the higher degree of *Master of Pharmacy*. For the attainment of this degree the candidate shall spend one entire year (three terms) at the University after graduation and during this period shall pursue advanced work in some science or sciences specially allied to Pharmacy. This shall

include the presentation of a dissertation embodying the results of an original investigation, which shall be satisfactory to the committee on higher degrees.

The degree of *Bachelor of Science* (*in Pharmacy*) is conferred upon students who have successfully met the requirements of the Four Years' Course.

FEES AND EXPENSES.

A matriculation fee of $5.

No tuition is required from students who are residents of the State of Wisconsin; non-residents pay $25 each year.

The fee for incidental expenses is $5 for the first term, $5 for the second term and $2 for the thi d term.

These fees must be paid before class cards can be issued.

The following laboratory deposits are required:

Junior Year.

In the Chemical laboratories	$20 00
General Inorganic Chemistry, Qualitative Chemical Analysis, General Organic Chemistry, } Each a full study for one term.	
In the Botanical Laboratory (full study, three terms) .	$8 00
In the Pharmaceutical Laboratory: Practical Pharmacy (two-fifths study, three terms)	$10 00

Senior Year.

Chemical Laboratory: Quantitative Chemical Analysis (full study, one term)	$10 00
Botanical Laboratory: General Anatomy and Anatomy of Drugs (full study, three terms)	$8 00
Pharm. Chem. Laboratory: Applied Chemical Analysis and Thesis (one and a half study, three terms; $15 fall term, winter and spring terms $10 each) . . .	$35 00
Pharmaceutical Laboratory: Practical Pharmacy (full study, three terms; $5 each term)	$15 00
Pharmacognostical Laboratory: Pharmacognosy (two-fifths study, three terms), incl. collection of drugs .	$10 00

In the chemical and pharmaceutical laboratories accurate accounts of material used and apparatus broken by the student are

kept, and such sums as may remain to the credit of the student at the completion of his course will be refunded.

No diploma fee is required upon graduation.

The payment of all university charges is to be made to Mr. E. F. Riley, Secretary of the Board of Regents, at his office in the Law Building.

The cost of board in clubs is from $2 to $2.50 per week; in private families from $3 to $4 per week; and rooms can be obtained in the city at correspondingly reasonable rates.

COURSES OF STUDY.

TWO YEARS' COURSE.

Junior Year.

Chemistry, 1; Biology, 20; Practical Pharmacy, 1, throughout the year; Hygiene for one term. Sufficient additional work, physics if possible, must be elected to make at least three full studies.

Senior Year.

Fall term.—Pharmaceutical Chemistry, 1, 2 and 4; Chemistry, 2; Biology, 16; Pharmacognosy.

Winter term.—Pharmaceutical Chemistry, 1 and 2; Biology, 16; Practical Pharmacy, 2; Pharmacognosy; Pharmaceutical Chemistry, 4, during the first half of the term to be followed by thesis work during the second half.

Spring term.—Pharmaceutical Chemistry, 1 and 3; Biology, 16; Practical Pharmacy, 2; Pharmacognosy; Thesis.

Synoptical lectures in Mineralogy, Paleontology, and Geology must be taken at some time during the course.

FOUR YEARS' COURSE.

Freshman Year.

Biology, 1; German, 9; Mathematics, 1, 2, 3; Rhetoric, 2; Hygiene, 1.

Sophomore Year.

French, 3; Chemistry, 1, 2, 3; Physics, 1, 2; Rhetoric, 3.

Rules concerning gymnastics and military drill will be adopted before the opening of the college year, 1894–5.

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* The figures refer to the numbers of the courses as given in the statements under Departments of Instruction, College of Letters and Science, and School of Pharmacy.

Junior and Senior Years.

Pharmaceutical chemistry and botany must be taken for two years. If chemistry is elected as major study, botany must be taken as assigned minor, or vice versa. The elective minor study can be made up of a series of courses or of a single continuous course, and must be at least equivalent to a full study throughout the last two years of the course. In this practical pharmacy must be included. Pharmacognosy may be taken as a combination of anatomy of drugs or assigned minor in botany.

With regard to Synoptical Lectures and rules of the Group system, compare pages 58-59 of the general catalogue.

DEPARTMENTS OF INSTRUCTION.

GENERAL CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, MR. KAHLENBERG, AND MR. ANDERSON.

1. General Elementary Chemistry. A daily exercise throughout the year, as follows:

   Fall term.— Descriptive Inorganic Chemistry, lectures and laboratory work. *Lectures at* 2. Professor DANIELLS, Assistant Professor HILLYER and Mr. ANDERSON.

   Winter term.— Qualitative analysis, with frequent reviews and class-room exercises. Assistant Professor HILLYER and Mr. ANDERSON.

   Spring term.— Descriptive Organic Chemistry, lectures and laboratory work. Assistant Professor HILLYER and Mr. ANDERSON.

2. Advanced Inorganic Chemistry, second year. Quantitative work in determining the equivalence of elements, the densities of gases, the principles of gravimetric and volumetric analysis and their applications in the analysis of ores, crude metals, slags, technical products, and gases, together with one exercise each week in theoretical chemistry, the solving of chemical problems, and the history of chemistry. *Daily throughout the year.* The amount of time devoted to this subject may be more or less than that of a full study, and will be arranged upon consultation with the instructors. Students in pharmacy are required to take a full study during the fall term in this subject. Professor DANIELLS and Mr. KAHLENBERG.

3. Advanced Inorganic Chemistry, third year. The amount of time and the character of the work will be arranged upon consultation with the instructors. Besides the work required for a graduation thesis, it may consist of advanced work in theoretical, physical, or analytical chemistry, or in research work. Professor DANIELLS and Mr. KAHLENBERG.

4. Advanced Organic Chemistry. Reviews and expansion of the work of the elementary course, with laboratory work mainly in the preparation of aromatic compounds, accompanied by special work on assigned topics. *Full study, fall term.* Assistant Professor HILLYER.

Organic analysis, determination of physical constants, special and research work with preparation of thesis. *Full study for winter and spring terms.* Assistant Professor HILLYER.

The division of time between organic and inorganic chemistry for the Junior and Senior years will be made after consultation with the instructors.

Students wishing to become practical chemists, physicians, teachers, etc., will so far as is possible be given work that will be of greatest service in accomplishing the end they have in view.

5. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1893–94.

Twelve hours' laboratory work a week is regarded as the equivalent of a full study.

The chemical library is well supplied with works of reference and with chemical periodicals, enabling students to familiarize themselves with the most recent investigations bearing upon the work in hand.

Instructors and advanced students will meet weekly during the year to report on articles in the current chemical journals and on assigned topics suggested by recent work in chemistry. Nearly all the more important chemical journals are accessible for use in this work, and the department library is steadily growing by accessions of the best books of reference.

PHARMACEUTICAL CHEMISTRY.

PROFESSOR KREMERS AND MR. URBAN.

1. Pharmaceutical and Pharmacognostical Chemistry. This course will consist of a review of general chemistry, inorganic and organic, with special adaptation of the subject-matter to the interests of pharmacy. Richter's Inorganic Chemistry, Bernthsen's Organic Chemistry, U. S. Pharmacopœia, 1890. *M., Tu., Th., F.* Professor KREMERS.

2. Chemical and Pharmaceutical Operations. A continuation of Course 1 in practical pharmacy. The topic system will be employed. *W. of fall and winter terms.* Professor KREMERS.

3. During the spring term one lecture or recitation per week will be devoted to the study of some historical subject, the subject to be announced at the opening of the term. *W.* Professor KREMERS.

4. Applied Chemical Analysis. Chemical analysis, qualitative and quantitative, gravimetric and volumetric, in its application to pharmacy. This will be chiefly a laboratory study with weekly recitations and lectures. It will not, however, be merely a study of methods but also of chemical principles involved. *Three hours daily during the fall term and part of winter term.* Hoffman & Power, Examination of Medicinal Chemicals. U. S. Pharmacopœia, 1890. Professor KREMERS and Mr. URBAN.

5. Advanced Work for Preparation of Thesis. Students who have pursued the chemical studies prescribed in the short course for a year and a half may prepare a thesis in this department, subject to be chosen on consultation with the instructor. Professor KREMERS and Mr. URBAN.

6. Course in Non-nutritive Plant Constituents. Students in botany who have had at least a year's work in general chemistry can upon special arrangement take this course. *Full study for at least one term.* Professor KREMERS and Mr. URBAN.

6. Advanced graduate work adapted to the individual.

BIOLOGY, INCLUDING PHARMACEUTICAL BOTANY.

PROFESSOR BIRGE, PROFESSOR BARNES, ASSISTANT PROFESSOR RUSSELL, DR. MILLER, DR. MARSHALL, AND MR. CHENEY.

1. General Biology. Introductory to both botony and zoology, and required as preliminary to all advanced work in either department. Two recitations a week from Parker's Biology and ten hours weekly of laboratory work, using as a hand-book Huxley and Martin's Elementary Biology. The recitations are given in the afternoon, at 3 in the fall

term. 2 in winter and spring terms. The class meets in two divisions, *M., W.; Tu., Th.* Professor BARNES and Professor BIRGE. For laboratory work the class is divided into two or three sections, each meeting for two hours daily. Dr. MARSHALL.

4. Human Physiology. Three recitations weekly are given to the study of Martin's The Human Body. *Fall and winter terms; M., W., F., at* 8. Professor BIRGE.

This course may be followed in the spring term by Hygiene 2.

16. Vegetable Histology. Systematic study of the tissues of phanerogams and ferns Use of reagents and stains, modes of imbedding, section cutting and mounting. Ten hours a week, two terms. Laboratory guide: Strasburger's Practical Botany. *Daily; hours on consultation.* Professor BARNES and Mr. CHENEY.

20. General Morphology of Plants. An elementary course designed primarily for Pharmacy students, but open to others who desire to begin the study of botany. *Fall term;* the form and structure of the vegetative organs of seed-plants; *Winter and spring terms;* the morphology of fungi, algæ, lichens, mosses, and ferns, illustrated by selected types; closing with a study of the flower of seed-plants. The course will be supplemented by botanical excursions, six in the autumn and ten in the spring. *Daily*, 9–11. Excursions on Saturdays. Mr. CHENEY.

21. Herbarium Work. Pharmacy students are required to prepare during the summer, and to present at the opening of their Senior year, a collection of 50 species of seed-plants from the vicinity of their homes, named and mounted; 25 of these are also to be fully described.

A duplicate of this collection in which the plants are named, but not mounted nor described, must also be presented; this will be retained by the University. Mr. CHENEY.

22. Anatomy of Drugs. Vegetable histology applied to the examination of commercial drugs. Course 16 must precede this. The drugs from collection required in the study of pharmacognosy will be used. *Spring term; M., Tu., W., Th., F.*, 11–1. Mr. CHENEY.

*23. Bacteriology. General course including the study of typical forms with microscope and cultures. Special attention will be given during the latter part of the term to the disease-producing organisms. Lectures and recitations, 2-3 hours; laboratory, 10 hours weekly. *Winter term; full study.* Assistant Professor RUSSELL.

PHARMACOGNOSY.

(INSTRUCTOR TO BE APPOINTED.)

As the study of petrology must be preceded by that of physics and chemistry and that of mineralogy and geology, so the study of pharmacognosy must properly be preceded by the study of general and pharmaceutical chemistry on the one hand and of general and pharmaceutical botany on the other hand. Again as the student of petrology studies rocks in their natural position and in hand specimens rather than from text-book descriptions, so the student of pharmacognosy should properly study medicinal plants and specimen drugs derived therefrom, rather than lecture notes or text-books. Students are therefore required to systematically arrange a collection of drugs (for which the material is largely furnished), to neatly label each specimen and as far as possible make sections and drawings with descriptions of the same. This work is supplemented by topics on the general natural history of the plant from which the drug is obtained; habitat, cultivation, collection, commerce, botanical description, chemical composition, history, uses, etc. While studying a topic the student is compelled to familiarize himself with works bearing on the subject, which otherwise would very largely escape his notice. The study of vegetable materia medica is often made to consist in commiting to memory text-book description of drugs, o sections of drugs, etc., probably without having ever seen them. In this course, however, the student is taught to follow the methods of modern scientific research. In this work he is aided by lectures delivered by members of the faculty. Maisch, Materia Medica, National Dispensatory.

* Only those courses are enumerated here which are of special interest to the pharmaceutical student. Further information concerning studies offered in the biological departments see p. 98.

PRACTICAL PHARMACY.

(INSTRUCTOR TO BE APPOINTED.)

1. Pharmaceutical Operations. Laboratory practice in the use of the balance, the determination of specific gravity according to various methods, and other subjects of a mechanical nature. From the subject of heat another series of subjects will be selected, including determination of melting point and boiling point, methods of crystallization, etc. The laboratory exercises will be supplemented by lectures and recitations. *A two-fifths study throughout the Junior year.* Students with good standing may elect more work upon consultation with the instructor and class officer.

2. Examination of commercial articles, chemicals, and vegetable drugs, including assaying of the latter; manufacture of galenical preparations and testing of the same when finished; compounding of physicians' prescriptions, and such other laboratory practice as may be incidental to a dispensary and pharmaceutical laboratory. These laboratory exercises will be supplemented by lectures and recitations upon various practical subjects, viz.: the United States Pharmacopœia and pharmacopœias of other countries, the principal classes of galenical preparations, pharmaceutical tests, qualitative and quantitative, including drug assaying, dispensing, etc. *A full study throughout the Senior year.*

HYGIENE.

PROFESSOR ALMAH J. FRISBY.

Lectures on hygiene are given twice a week during the fall and winter terms. The course each term covers the subjects of sanitary sites and modes of construction of houses, house drainage and sewerage, water supply, ventilation and heating, food and drink, exercise, clothing, care of the person, preservation of eyesight and hearing, communicable diseases, treatment of emergencies.

PHYSICS.

General Physics. PROFESSOR SNOW AND DR. AUSTIN.
Mathematical Physics. PROFESSOR DAVIES.

1. General Lectures. Mechanics and Heat. Electricity and Magnetism. Acoustics and Optics. Two lectures a week. *Throughout the year.* Two sections; *M., W., at* 12; *Tu., Th., at* 12. Professor SNOW. One recitation on Friday or Saturday by the class in smaller sections, at hours to be assigned. Professor SNOW and Dr AUSTIN.

   This course is intended for those taking up the study for the first time, or for those who have studied it only in an elementary manner. A knowledge of plane trigonometry, including the use of logarithms, is required for registration in this course.

2. Introductory Laboratory Practice. An introduction to the theory and methods of physical measurements.

   This course is intended to accompany Course 1. *Throughout the year; twice a week; hours to be assigned.* Dr. AUSTIN.

   Short course students are urgently recommended to take Course 1 if prepared for the same. Long course students are expected to take both courses.

MINERALOGY, PETROLOGY, AND GEOLOGY.

PROFESSOR VAN HISE, ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

3. Blowpipe Analysis and Determinative Mineralogy. This course consists almost entirely of laboratory work. It can be adapted to the needs of pharmacy students and may be made either a three-fifths or a full study. *Winter term,* 8-10.

7. Synoptical Lectures. The courses running through the year include mineralogy and petrology by Prof. Hobbs, systematic paleontology by Prof. Clements, and physical geology by Prof. Van Hise. Given in 1893-94, and alternate years thereafter. *M., at* 4.

THESIS.

A thesis is considered an important part of the course in as much as it supplements the general work. In the course of his earlier studies the student has surveyed large fields of learning, while at work on his thesis he concentrates his time and attention largely on one subject.

The student may select the subject of his thesis in any department in which he has received instruction provided he be found proficient by the instructor under whose personal supervision he chooses to carry out such work. About a term and a half, four hours daily, are expected to be given to the necessary laboratory experiments. However, time is not the only criterion. The thesis when written must be satisfactory to both instructor and class officer. It must be delivered to the class officer on or before the second Friday preceding graduation, accompanied by a written recommendation from the instructor.

All correspondence or inquiries relating to the School of Pharmacy should be addressed to Professor Edward Kremers, Madison, Wis.

WISCONSIN SUMMER SCHOOL.

REGENTS.

OLIVER E. WELLS, State Superintendent of Public Instruction.
CHARLES K. ADAMS, President of the University of Wisconsin.

INSTRUCTORS.

JOHN W. STEARNS, LL.D. *Professor of Philosophy and Peadgogy, University of Wisconsin,* President of School. — Psychology and Pedagogy.

CHARLES R. BARNES, PH.D. *Professor of Botany, University of Wisconsin* — Botany.

EDWARD A. BIRGE, PH.D. *Professor of Zoology, University of Wisconsin* — Physiology and Zoology.

W. W. DANIELLS, M.S., *Professor of Chemistry, University of Wisconsin* — Chemistry.

EDWARD E. HALE, JR., Ph.D., *Professor of English Literature, State University of Iowa* — English Literature.

WILLIAM S. MILLER, M.D., *Instructor in Vertebrate Anatomy, University of Wisconsin* — Histology.

W. H. ROSENSTENGEL, A.M., *Professor of German Language and Literature, University of Wisconsin* — German.

WILLIAM A. SCOTT, PH.D., *Associate Professor of Political Economy, University of Wisconsin* — Political Economy.

CHARLES S. SLICHTER, M.S., *Professor of Applied Mathematics, University of Wisconsin* — Mathematics.

BENJAMIN F. SNOW, PH.D., *Professor of Physics, University of Wisconsin* — Physics.

HIRAM A. SOBER, A.B., *Instructor in Latin, University of Wisconsin* — Latin.

FREDERICK J. TURNER, PH.D., *Professor of American History, University of Wisconsin* — History.

The seventh annual session of the Summer School will be held at the University from July 9 to August 3, 1894.

The school is supported in part by a small appropriation made by the State Legislature, the law granting which appoints the

State Superintendent of Public Instruction and the President of the State University as Regents of the School. In consequence of this the following rates of tuition have been established:

TUITION.

General fee $15.00
For residents of Wisconsin, reduced to 10.00

The exercises of the school will be held in Science Hall and the Chemical Laboratory of the University of Wisconsin. The first lectures will be given on Monday afternoon, July 9, at 2 P. M.

FOR WHOM DESIGNED.

While established primarily for the assistance of teachers and those preparing to teach in grammar and high school grades, the Summer School is by no means exclusively for such. It is open to any one wishing to pursue any of the branches of study specified in this circular. Those who are anxious to study at home and wish help and guidance as to matter and methods will find them here. High School graduates expecting to enter the University will find this School of use to them in supplementing the instruction they have received and making them better prepared for thorough work in their classes. University students desiring to extend their course in any of these lines, or to make up deficiencies in them, will find the School a valuable help. Those wishing to do special work during the summer looking to a thesis for graduation can usually make arrangements for such work with the instructors in this School. Students expecting to teach after graduation will find the courses especially valuable to them. Persons intending to take the state examinations, which commence the Tuesday after the school closes, will find here the help and guidance they need in finishing their preparation.

Teachers and principals of high and grammar schools will note the purpose indicated in the several branches to give assistance in the teaching of these branches. What to teach and how to teach it so as to meet the requirements of the University, and so as to secure the best results for average students, will be carefully considered in connection with each of the subjects.

CREDIT AT THE UNIVERSITY.

By consultation with the instructors, arrangements may be made in several of the branches, by which credit will be given in

the University for work done in the Summer School. Students desiring such credit must have passed the entrance examinations for one of the University courses, and must expect to pass a satisfactory examination upon the work done in the Summer School.

LABORATORIES.

The laboratories in Botany, Chemistry, Physics, and Zoology will be in charge of the professor or a competent assistant. The School has aimed to assist its students to acquire laboratory methods and to reach knowledge through laboratory work. The task is not an easy one as the short time at the disposal of the School renders it necessary to reach results at once, but the Faculty feel that they have succeeded quite up to their own expectations, and to those of the students. Those who wish to profit most from the school are advised to take not more than two courses in science and one elsewhere. Experience has shown that those students who attempt to cover more ground usually find that their work has been of only moderate value to them, while the best results have been reached by those who have spent several seasons at the school, devoting each session to one or two studies only.

LIBRARIES.

The University Library, containing about 30,000 books and 8,000 pamphlets will be open for the use of the students of the Summer School. They can also have access to the library of the State Historical Society, which contains 98,000 volumes and 69,000 pamphlets, undoubtedly one of the most complete and valuable collections of historical material to be found in the Northwest. The Madison city library, of over 13,000 volumes, will also be accessible for all the purposes of the school.

BOARD.

Board can be obtained in Madison at the rate of $2.50 to $4.00 per week for table board, and $5.00 to $6.00 per week, including room rent.

The Ladies' Hall of the State University will be opened during the session of the school. Ladies who wish to secure rooms and board there should make early application to Mrs. J. C. Lander, Madison, Wis.

EXTENSION LECTURES.

During the session of the Summer School, extension lectures, free to all who choose to attend them, will be delivered at the University. These lectures will usually occur in the evenings, and the references for readings will prove especially valuable to students on account of the library facilities in the city. These lectures, as will be seen by the descriptions of courses, will be in the History of the United States, in Political Economy, in Bacteriology and in Æsthetics. They constitute a new and attractive feature of the School, and it is hoped may prepare the way for regular Summer Extension Conferences, such as have proved so popular and useful at Oxford and Cambridge.

In addition to the courses of lectures mentioned in the departments of instruction, the following course in Æsthetics will be given: 1. The Relations and Origin of the Fine Arts. 2. The Growth of the Fine Arts. 3. Sculpture—Oriental and Greek. 4. Architecture—Ancient. 5. Architecture—Byzantine and Romanesque. 6. Architecture—Gothic and Renaissance. These lectures will be especially helpful to students and teachers of history and literature.

OTHER ATTRACTIONS.

Few cities in this country can offer more attractions as a summer resort than Madison, and teachers and others desiring to combine recreation with cultivation will be able to do so by undertaking only such work in the School as they may feel disposed to do. No examinations are required for admission, nor are any given at the close of the session, except to those who apply for them in order to receive credit in the University. The School aims to do earnest, vigorous work, but while seeking especially the patronage of those who wish to spend the summer in this way, welcomes also others who wish to give to it only a portion of their time.

The Monona Assembly is held on the east shore of Lake Monona, opposite Madison, during the last ten days of the session, and members of the School who wish to do so can avail themselves of the attractions in its program.

DEPARTMENTS OF INSTRUCTION.

PSYCHOLOGY AND PEDAGOGY.

PROFESSOR STEARNS.

1. The course in Psychology will have especially in view the theory of teaching, and will therefore be directed to those topics which bear most closely upon pedagogy. By selecting the topics in this way it is hoped that more time can be given to each one, and the practical bearings of the study can be made more prominent. The special field of work will therefore be cognition, to the general view of which will be added a more detailed study of the reasoning powers. An important feature of the course will be special topics and references for investigation and report by such members of the class as choose to undertake this work. Murray's Handbook of Psychology is specially recommended to those intending to take this course, and it will be found the most convenient manual as a guide to the class work. Arrangements for advanced work in Psychology will be made for those who desire it, in such manner that a good elementary course can be well completed in two terms of the school.

2. In Pedagogy. Two courses of two weeks each will be offered. The first will relate to the history of the educational doctrines. Oscar Browning's History of Educational Theories will be the most convenient book for the students to use in this course. The purpose of the course will be to make more clear the origin of the views now held as to the philosophy of teaching.

3. The second course of two weeks will be devoted to outlines of the Herbartian Pedagogy. The special interest developed in this country during the past two years in this subject gives it much significance at the present time, and it is believed that many teachers will be glad to avail themselves of this opportunity to become familiar with its leading doctrines.

4. If desired by a sufficient number of those in attendance, a Seminary class will be formed for the study of special topics in this department. One feature of its work will be to extend acquaintance with educational movements in foreign countries, and to familiarize its members with some of the best current publications in this department.

POLITICAL ECONOMY.

PROFESSOR SCOTT.

1. Practical Economics. This course will consist of a rapid survey of the most important features of the economic history of the United States and England during the past century, followed by a discussion of those economic topics which may with propriety be introduced into the courses of study of our high schools. Courses of reading will be assigned on each topic discussed, and the lecture of each day will be followed by a quiz and a conference on both the reading assigned and the subject-matter of the lecture. Students who contemplate taking this course are advised to read carefully in preparation for it Ely's Outlines of Economics.

2. Money and Credit. A course of six lectures on the University Extension plan. The topics discussed are as follows: I. The Functions, Material, Coinage, and Circulation of Money; II. Government Paper Money; III. Bank Money or Checks, Drafts and Bills of Exchange; IV. Bank Accounts and the Bank Reserve; V. Monetary Crises and Panics; VI. The Silver Question.

Students who have adequate preparation and who wish to do more advanced work than that outlined in these courses will receive the personal guidance and attention which their cases require.

HISTORY.

PROFESSOR TURNER.

1. The Study of History. Lectures on the significance of history and the methods of studying and teaching the subject, as illustrated by selected topics in general history. Students intending to take the course would profit by a

prior reading of the recommendations of the historical conference, embraced in the Report of the Committee on Secondary School Studies appointed at the meeting of the National Educational Association, 1892, and issued by the U. S. Bureau of Education, Washington, D. C.

2. The Colonization of North America. A course of six University Extension lectures, designed to show in outline how European men, institutions and ideas entered America, and how America modified and developed them. The course covers the period from the earliest times to 1763.

3. American Politics from 1763 to 1840. In this course an attempt is made to explain the struggle for independence and the rise of nationalism. Besides a study of the development of political forces and institutions, some account is given of the social and economic conditions of the United States at different periods from 1790 to 1840, with particular reference to the spread of population westward. Text-books: Hart's Formation of the Union and Wilson's Division and Reunion, both published by Longmans, Green & Co., 15 East 16th St., New York City.

ENGLISH LITERATURE AND RHETORIC.

PROFESSOR HALE.

1. Constructive Rhetoric. A study of the various means of increasing the power of expression.

2. English Poets. Shakespeare, Milton, Pope, Tennyson.

3. American Authors. Hawthorne, Emerson, Longfellow, Whitman.

The particular study of a few authors is better than any extended study of many. The aim of the instruction in all the courses, will be to give the students ideas of how to go to work, rather than practice in working. This seems the only thing that can be done in the time at command, and, therefore, authors have been chosen who illustrate as many points as possible upon the proposed courses.

GERMAN.

PROFESSOR ROSENSTENGEL.

1. One course only will be offered in this subject. It is not intended for beginners in German as the session of the School is too short to make such a course profitable. It offers to teachers or students who intend to teach German an opportunity of reviewing the grammar and the reader, and of gaining facility in speaking and writing German. Much attention will be paid to the methods of teaching German, especially to the methods necessary for securing the preparation in German which is demanded of students who are to enter the university.

MATHEMATICS.

PROFESSOR SLICHTER.

1. Algebra. The course in algebra will be planned with reference to the special needs of high school instructors, and with a view of simplifying and improving instruction in the subject. While the pedagogical side of the course will be emphasized, it is the intention to render the course as helpful as possible to those who are preparing for examination.

2. Geometry. The same general plans will be followed in this course as in the course in algebra. A synopsis of high school work in geometry will be developed which can be adequately given in the usual one year course, and at the same time will contain all that is required for admission to the University. Text-books on geometry have become so cumbrous that it is believed that this will be a useful feature of the course.

3. Plane Trigonometry and Surveying. This course will be given if a number large enough to justify the formation of a class apply for it. No previous knowledge of the subject will be assumed. The work will consist of six class meetings a week in plane trigonometry and of field practice in the practical use of the common surveying instruments. The field practice may be omitted by those who desire to

do so. The instructor desires to correspond with all who wish to take this course before the opening of the summer school.

The instructor in mathematics will be glad to give all the assistance in his power to members of the mathematical classes in addition to the courses outlined above. Correspondence on any point connected with the work is freely invited.

LATIN.

MR. SOBER.

1. The purpose of this class will be to aid teachers of Cæsar and Virgil. For this purpose the first two weeks of the term will be devoted to reading portions of Cæsar, with especial reference to the kind of work needed by those beginning to read Latin prose. The last two weeks will be given to Virgil, selections being made with a view to showing how the author may most profitably be used with high school classes. As the class is for teachers, a fair knowledge of the grammar and some skill in translation will be assumed on the part of those enrolling for the study.

PHYSICS.

PROFESSOR SNOW.

It is the object of the Department of Physics to give such work during the Summer School as will best enable the teacher to conduct successfully his classes in the high school. It will, at the same time, afford a valuable enlargement of knowledge to students who have merely a text-book acquaintance with the subject. A knowledge of an elementary text-book, such as Gage or Avery, will be a useful preparation for the course. Two courses will be given in the subject:

1. A course of lectures will be given daily in which the various branches of the subject will be taken up and discusseb as fully as the time will permit. Owing to the prominence now occupied by electricity, more attention will be devoted to the study of this subject than to the others which will also be treated. Throughout the entire course the needs of the teacher will be kept in mind, and the ex-

periments with which the lectures are illustrated will be, in the main, such as can be performed with limited apparatus before a class in the high school.

2. In connection with these lectures there will be offered a course of laboratory practice in which especial attention will be given to acquainting the teacher with such methods and experiments as will aid him in conducting his own classes in physics.

CHEMISTRY.

PROFESSOR DANIELLS.

1. Descriptive Chemistry. A lecture course upon the more commonly occurring elements and their combinations, and upon chemical theory as illustrated by the compounds studied. This is illustrated by experiments, and is both for beginners and for those wishing to take a rapid review of the subject.

2. A laboratory course in general chemistry in which the student will perform his own experiments under the direction of the instructor in charge.

Courses 1 and 2 supplement each other. It is intended that they shall lead the student to observe facts, and to trace the relation between observed facts and those fundamental laws that are included under the general name of chemical theory. On these accounts it is advisable that both courses be taken together.

3. Qualitative Analysis. This course is for those already familiar with the elementary principles of chemistry. Known compounds containing the more important acids and bases are first analyzed to familiarize the student with methods of work, and to teach him to observe, classify, and record phenomena, after which unknown salts, both simple and mixed, ores, crude metals, minerals, and substances used in the arts will be analyzed.

4. Quantitative Chemistry. Two lines of work are here offered, both of which include the use of the balance.

(a) Work in determining the equivalents of elements, the synthesis and analysis of gaseous substances, and the determination of the molecular volumes of gases.

(b) Quantitative Analysis. The instruction in this course includes both gravimetric and volumetric methods, and is designed to teach the principles underlying the best methods of practice.

A laboratory fee sufficient to cover the cost of material used by each student will be charged.

BOTANY.

PROFESSOR BARNES.

Two courses are offered:

1. The Morphology of Cryptogams. The course will consist of daily lectures and conferences explanatory of the plants studied in the laboratory, the difficulties encountered and questions raised in their study, with special reference to the employment of the same method in secondary schools.

The laboratory work will occupy two hours daily and will be devoted exclusively to the examination of various types of common cryptogams *with the same instruments and by the same methods* as can be used in ordinary high school courses. Fresh water and marine algæ, moulds, blights, lichens, puff-balls, mushrooms, liverworts, mosses, horse-tails, and ferns will be studied. Directions will be given for collecting and preserving such material, and excursions for those interested will show where it is to be obtained.

Those taking this course should have Bessey's Botany or at least Bessey's Essentials of Botany, for reference.

2. Laboratory Practice in the Anatomy of Flowering Plants. This course is intended to show the modern methods of laboratory study, recommended in the high school manual issued by the State Superintendent, as applied to the higher plants heretofore studied. Such methods only will be used as are desirable and practicable in high schools having a limited equipment.

This course is intended primarily for teachers but is open even to those who know nothing of the subject.

Students taking course 2, will provide themselves with Spalding's Introduction to Botany (D. C. Heath & Co.).

Special Courses, consisting of work for which the student's previous training fits him, may be arranged. For such courses materials and instruments will be provided for a small fee

(not exceeding $1.00,) but to them only general oversight and direction can be given. Students must expect to work largely alone, consulting with instructor for plan of work and assistance in difficulties.

PHYSIOLOGY AND ZOOLOGY.

PROFESSOR BIRGE AND DR. MILLER.

1. Physiology. The plan of the course in Physiology will be substantially the same as in former years. Its aim is to show the meaning and connection of physiological facts to those who have already an elementary knowledge of the facts. An elementary knowledge of the subject will be expected from the student, and the daily exercise will be given to conversations and recitations on points likely to be misunderstood and to those topics which it is desirable to enforce in teaching. The student should be prepared on the general anatomy of the body, on the elementary facts of circulation, digestion, respiration, and nervous action. If such a book as Martin's Human Body, briefer course, has been prepared before coming to the school the student will be able to get some profit from the lectures without devoting much time to the study outside of the class-room. A careful reading of the larger book of the same series would be a good preparation for the course on the part of more advanced students, especially those who have taught physiology. The course will be illustrated by the Auzoux manikin, by models of eye, ear, heart, and brain, and the human skeleton.

2. Elementary Comparative Anatomy. The study in laboratory of the amoeba, hydra, earthworm, clam, crayfish, grasshopper and frog, with the addition of such other types as the students are able to take. Huxley and Martin's Elementary Biology, Marshall and Hurst's Elementary Zoology, Dodge's Biology, or Colton's Zoology may be used as laboratory handbooks. No student should devote less than two hours per day to this course, and a satisfactory result will hardly be reached unless three or four hours are given. The laboratory work will be accompanied with such recitations as may seem desirable.

3. Elementary Systematic Zoology. The student who intends to take this course will do well to prepare the classification of some text-book as carefully as possible before coming. He can then give all his time to study of specimens, and to the class work. The University has a good set of glass models of protozoa and cœlenterata, alcoholic specimens from the Naples Zoological Institute, covering the invertebrates, except insects, collections of echinoderms, corals, and mollusks, vertebrate skeletons, etc., so that there is ample material for the illustration of the course. The daily recitations will turn chiefly on points not fully brought out by text-books, and will not be designed to test the student's knowledge of the book. The laboratory is well provided with microscopes, simple and compound, and with other apparatus and specimens for the use of students.

4. Histology. This course will consist of lectures and laboratory work. In the lectures attention will be directed to the best of the modern methods for preparing tissues, and the results of modern research will be described. The lectures will be illustrated by numerous microscopic preparations. In the laboratory the practical working of modern technique will be shown; abundant material will be placed at the disposal of the students and all will have the opportunity of providing themselves with a set of microscopic slides.

   Special attention will be given to teachers who desire to obtain sets of slides for their own school work.

5. A course of six University extension lectures in Bacteriology will be given during the session of the School. These will be illustrated with charts, lantern slides, microscopic preparations, and cultures of bacteria.

For further information regarding the Summer School, address

PROFESSOR J. W. STEARNS,
Madison, Wis.

DEGREES CONFERRED.

COMMENCEMENT, 1893.

BACHELOR OF ARTS.

Walter Thomas Campbell.
Joseph Aaron Carter.
Fred Morris Jackson.
Herbert Henry Jacobs.
Amanda Marie Johnson.
Christian N. Johnson.
William Fredrick Leich.
Charles Coolidge Parlin.
Herbert Scott Siggelko.
Mary Elizabeth Smith.
M. Victor Staley.

Mathematical Group.

Mary Pauline Richardson.

BACHELOR OF LETTERS.

Modern Classical Course.

Martha Sumner Baker.
Frances McConnell Bowen.
Mary Catharine Brown.
Daisy Jewell Chadwick.
Ella Davis.
Robert Baldwin Dunlevy.
George Tobias Flom.
Bessie E. Haggerty.
Lillian Belle Heald.
Jennie A. Huenkemeier.
Margaretta Bradley Lewis.
Helen Louise Mayer.
Mary Isabella Murray.
Gertrude Belle Nutting.
Anna Irene Oakey.
John Henry Paul.
Katherine D. Post.
Agnes Clarissa Ralph.
Harriet Jane Richardson.
Charles Henry Williams.
Florence Virginia Williams.
George Edgar Williams.

Civic Historical Course.

Theodore W. Benfey.
John Jeremiah Blake.
Samuel Albert Bostwick.
Harvey Clark.
John Francis Doherty.
Malcolm Campbell Douglas.
Frederick Roche Estes.
Edward Joseph Frawley.
Thomas H. Garry.
Julie Ellen Murphy.
George Douglas Pease.
Charles Britton Rogers.
Edgar F. Strong.
James L. Thatcher.
Ellen Breese Turner.

English Course.

Edward Monroe Beeman.
Emma Almeda Buckmaster.
Charles Herrick Doyon.
Sabena Herfurth.
George Henry Katz.
George Albert Kinsman.
Luella Belle Knapp.
Joseph Thomas Lindley.
Jennie Augusta Maxon.
Josephine Marie Merk.
Joseph E. Messerschmidt.
Carlotta May Millard.
Herbert J. Piper.
Sarah Anderson Potter.
Claude Milligan Rosecranz.
Clara Otelia Schuster.
Frederick Frank Showers.
Mary Grace Strahl.
Louis Dunning Sumner.
Ernest Farwell Ward.
Platt J. Whitman.
Archer Romeo Ziemer.

English Group.

Charles Chester Case.

Mathematical Group.

Mary Hough Oakley.

Historical Group.

Louis Henry Fales.
James Francis Griffin.
Edward Sawyer Hardy.
Herbert Michael Haskell.
Frank Katzenstein.
George Kroencke.
William Chester McCard.
Louis Wescott Myers.
Carrie Anne Owen.
Hubert Esterly Page.
Edmund Ray Stevens.

Germanic Group.

Jessie Griffith.

BACHELOR OF SCIENCE.

General Science Course.

Mary Belle Austin.
Charles Harris Ayer.
Frederick Elmer Bolton.
Howard Erastus Burton.
Rosalia Amelia Hatherell.
George Mellinger Holferty.
Guy LeRoy Hunner.
Frank William Jones.
Frederick William Meisnest.
Rupert Merrill Parker.
James Barkley Pollock.
Albert John Reed.
Ella Elizabeth Ruebhausen.
Kate Lucinda Sabin.
James Rollin Slonaker.
Harriet Smith.
Benjamin Thomas.
Anna Elizabeth Woodward.

Mathematical Group.

Henry Freeman Stecker.

IN ENGINEERING.

Civil Engineering Course.

James H. Brace (1892).
Frederick Filer Fowle.
John Howell Griffith.
James C. Hain.
Patrick Festus Joyce.
Charles Thuringer.
Gustav Otto Viebahn.
Beverly Lyon Worden (1892).

Metallurgical Engineering Course.

Herbert Jean Harris.

Mechanical Engineering Course.

William L. Erbach.
Gerdt A. Gerdtzen.
Robert Henry Hackney.
Oscar Francis Minch.
John Frank Sweet.
Leonard Lafayette Tessier.
James Rowley Young.

Electrical Engineering Course.

Harry Bartlett Alverson.
Harry Bingham Boardman.
William Corwin Burton.
Frederick Howe Ford.
Henry Ackley Lardner.
Walter Joseph Richards.
Alvin Isaac Smith.
James Glenn Wray.

IN AGRICULTURE.

Wilber F. Stiles.

GRADUATE IN PHARMACY.

Oscar William Anderson.
Harold Nicholas Brunn.
Arthur Lewis Emde.
Walter Flavius Gilman.
Charles John Habhegger.
Robert Irving Halsey.
Ernst David Hanf.
Henry Oscar Hilfert.
Fritz William Meissner.
William Dow Roberts.
Max Henry Strehlow.
William Alexander Turner.
Willibald Johannes Wehle.
Edward Williams.

BACHELOR OF LAW.

George G. Armstrong.
Arthur Babbitt.
Ernest Albert Baker.
George Lewis Blum.
Charles Rudolph Blumenfeld.
Max Albert Blumenfeld.
Julius Bruess.
Charles Thomas Bundy.
Bert Campbell.
Thomas M. Casey.
George Henry Clendenin.
James Patrick Conway.
Henry Cummings.
George Holmes Daubner.
Charles Austin Dickson.
George Elbert Dietrich.
Hervey William Dietrich.
Francis William Dockery.
William Francis Dockery.
Fred Doering,
Francis Marion Dyer.
Carl Felker.
Casper Ernest Fiedler.
George Casper Flett.
Jacob Fliegler.
Charles Henry Gaffney.
Winfield Warren Gilman.
Nathan Glicksman.
Casimer Gonski.
Raleigh Allen Goodrick.
Bradley Horatio Hackett.
Hualpi Alto Hartley.
James Timothy Hogan.
John Price Hughes.
Charles Clements Hunner.
George Bain Ingersoll.
John Nesbit Kirk.
Gustav Adolph Kuechle.
Herbert Norman Laflin.
John S. Larson.
Thomas Bertram Leonard.
George W. Levis.
Alice Tylson Mather.
Thomas McBean.
Hugh Jocelyn McGrath.
Colin Eneas McMullen.
George Henry Metcalf.
Charles Smith Miller.
Robert Ellis Mitchell.
Henry Hotchkiss Morgan.
Edwin T. Morrison.
George Edwin Morton.
John Hiles Moss.
Lawrence Bartholomew Murphy.
John V. Norcross.
Charles Adam Orth.
Charles Herman Phillips.
Joseph Rice.
Ralph Ricker.
Hugh James Rooney.
Edward Myron Sabin.
Nat Woodside Sallade.
Charles Marston Sanborn.
Frank Schoenfeld.
Clyde Hamilton Sedgwick.
James A. Sheridan.
William Smieding.
Ferdinand R. Smith.
Nissen Peter Stenhjem.
William Henry Tasker.
Nicholas Thauer.
John Cameron Thompson.
David Knutson Tone.
Charles C. Townsend.
Leverett Case Wheeler.
Samuel Williams.
William Frederick Wolf.

MASTER OF ARTS.

Leonard William Hatch, A.B. (Oberlin College), in Economics — *Thesis:* "*Administration of the Customs.*"

Cornelius Rasmussen Hill, A.B. (University of Wisconsin), in Greek — *Thesis:* "*The Women of Sophocles.*"

Fred Monroe Tisdel, A.B. (Northwestern University), in English Literature — *Thesis:* "*The English Dramatists before Shakespeare.*"

MASTER OF LETTERS.

Katherine Allen, B.L. (University of Wisconsin), in Latin — *Thesis:* "*Appreciation of Nature in Lucretius.*"

Matthew Brown Hammond, Ph.B. (University of Michigan), in Economics — *Thesis:* "*The History of Taxation in Wisconsin.*"

Augusta Lee Giddings, B.L. (University of Wisconsin), in French — *Thesis:* "*Molière.*"

Orin Grant Libby, B.L. (University of Wisconsin), in History — *Thesis:* "*The Erie Canal a State Enterprise.*"

George Wilton Moorehouse, B.L. (University of Wisconsin), in Psychology — *Thesis:* "*A Partial Report of a Statistical Study of Memory.*"

MASTER OF SCIENCE.

Louis Kahlenberg, B.S. (University of Wisconsin), in Chemistry — *Thesis:* "*On the Action of Lead Monoxide on Salts of Hydroxy-acids.*"

John Lockwood Mead, A.B.,B.S. (Lawrence University), Ph.G. (University of Wisconsin), in Pharmaceutical Chemistry — *Thesis:* "*On Abietic Acid.*"

Hattibel Merrill, B.S. (University of Wisconsin), in Zoology — *Thesis:* "*The Structure and Relationships of Bunops scutifrons.*"

Walter Camp Parmley, B.Met.Eng. (University of Wisconsin), in Geology — *Thesis:* "*On the Structural Geology of a Portion of the Wahsatch Mountains, near Ogden, Utah.*"

MASTER OF AGRICULTURE.

John Henry Shepperd, B.Agr. (Iowa Agricultural College), — *Thesis:* "*The Milking Qualities of Ewes.*"

MECHANICAL ENGINEER.

Charles Harvey Hile, B.S. (Pennsylvania State College) — *Thesis*: "*The Transmission of Power.*"

DOCTOR OF PHILOSOPHY.

Kate Asaphine Everest, M.A. (University of Wisconsin) — *Thesis*: "*German Immigration into Wisconsin.*"

David Kinley, A.B. (Yale University) — *Thesis*: "*The Independent Treasury.*"

HONORARY DEGREES.

Master of Arts.

Mrs. Anna R. Sheldon, - - - - - - - - Madison.

Doctor of Laws.

James G. Jenkins, - - - - - - - - - Milwaukee.
Judge U. S. Circuit Court, Seventh Judicial Circuit.

Romanzo Bunn, - - - - - - - - - - Madison.
Judge U. S. District Court.

Frederick H. Wines, - - - - - - - Springfield, Ill.
Special Agent of the United States for Dependent and Delinquent Classes.

HONORS IN SPECIAL STUDIES.

Helen Louise Mayer, in German — *Thesis:* "*Maria Stuart in der Geschichte und in der Dichtung.*"

James Barkley Pollock, in Botany — *Thesis:* "*On the structure of the Costa in Certain Species of the Genus Hypnum.*"

Walter Joseph Richards, in Electrical Engineering — *Thesis:* "*Electrolytic Separation of Lead and Silver from Fused Carbonate Ores.*"

Herbert Scott Siggelko, in Greek — *Thesis:* "*The Utilitarian Ethics of Socrates.*"

Henry Freeman Stecker, in Mathematics — *Thesis:* "*On the Geometrical Origin of Elliptic Integrals.*"

Edmund Ray Stevens, in Economics — *Thesis:* "*A Study in Municipal Government.*"

GRADUATES.

Number of University Graduates, 1854–1893, . .	2,324	1893,	220
Ancient Classical Course, ...	304	. .	12
Modern Classical Course, ...	275	. .	23
English Course, ...	150	. .	24
Civic Historical Course, ...	26	. .	26
General Science Course, ...	409	. .	19
Normal Course (1865–68), ...	25	. .	
Engineering Courses, ...	157	. .	24
Law Course, ...	856	. .	77
Pharmacy Course, ...	112	. .	14
Agricultural Course, ...	10	. .	1

STUDENTS.

GRADUATES.

FELLOWS.

Katherine Allen, M.L., - - - - - 228 Langdon St.
Fellow in Latin, Room 15, University Hall.

Jessie Griffith, B.L., - - - - - - 708 Langdon St.
Fellow in German, Room 2, North Hall.

Charles Meredith Hubbard, M.S., - - 1019 University Ave.
Fellow in Finance, 3d floor, Law Building.

Herbert Henry Jacobs, A.B., - - - - 614 Langdon St.
Alumni Fellow in Philosophy, Room 5, University Hall.

Harry Kuhn, - - - - - - - - - 535 State St.
Fellow in Mathematics, Room 6, University Hall.

Orin Grant Libby, M.L., - - - - - 205 Lake St.
Fellow in History, Room 11, Main Hall.

John Lockwood Mead, M.S., - - - 932 W. Johnson St.
Fellow in Pharmaceutical Chemistry, Room 12, North Hall.

Walter Joseph Richards, B.S. (In Engineering), 231 W. Gilman St.
Fellow in Engineering, Science Hall.

Henry Freeman Stecker, B.S., - - - - 107 N. Broom St.
Fellow in Mathematics, Room 7, University Hall.

Henry Huntington Swain, M.A., - - - - 619 Francis St.
Fellow in Economics, Room 11, University Hall.

UNIVERSITY SCHOLARS.

Nellie Page Bates, Rockford, Ill., - - - 630 Langdon St.
A.B., Wellesley College, Economics.

Emma Helen Blair, Madison, - - - - 22 Mendota Ct.
B.S., Ripon College, Economics and History.

Adelbert Grant Fradenburgh, Madison, - - 206 State St.
A.B., Alleghany College, Economics and History.

RESIDENT GRADUATES.

Samuel Alfred Bostwick, B.L., Univ. of Wisc., *Eau Claire.*
History.

John Scott Buckley, A.B., Univ. of South Dakota, *Black Hawk.*
History.

Charles Jesse Bullock, A.B., Boston University, *Boston, Mass.*
Economics, History, and Political Science.

George William Bunge, A.B., Beloit College, *Eitzen, Minn.*
Political Economy.

Florence Cornelius, B.L., Univ. of Wisc., *Madison.*
Latin.

Adam Ulysses Crull, A.B., Indiana University, *South Bend, Ind.*
History.

Jeremiah John Cunningham, A.B., Univ. of Wis., *Monroe.*
German.

Parke Hill Davis, A.B., College of New Jersey, *Jamestown, N. Y.*
English Literature.

Abbie Fiske Eaton, *Beloit.*
German.

Louis Henry Fales, B.L., Univ. of Wisc., *Madison.*
History, Economics, Pedagogy.

Charles Jason Fenner, B.S., Univ. of Wisc., *Centralia, N. Y.*
Mathematics.

Clarence Bernard Hadden, B.L., Cornell Univ., *Catawba Island, O.*
Political Economy and History.

George Mellinger Holferty, B.S., Univ. of Wisc., *Kansas City, Kas.*
Botany.

George Henry Katz., B. S., Univ. of Wisc., *Milwaukee.*
Economics.

Frederick Thomas Kelley, B.S., Univ. of Wisc., *Mineral Point.*
Hebrew and New Testament Greek.

George Kroencke, B.S., Univ. of Wis., *Wilmot.*
Economics.

Henry Ackley Lardner, B.S., Univ. of Wisc., *Oconomowoc.*
Electrical Engineering.

Edward Read Lloyd, M.S., Ala. College, *Agr'l College, Miss.*
Dairying and Animal Husbandry.

William Clayton Lusk, B.S., Iowa Agr'l. Col. *Hazel, S. Dakota.*
Economics and History.

Alexander Everet Matheson, Ph.B., M.A., Beloit, *Elkhorn.*
Economics.

Edward Christopher Meland, B.L., Univ. of Wis., *Deerfield.*
Hebrew.

Frank Haden Miller, A.B., Univ. of Wisc., *Edgerton.*
History and Economics.

Flora Carlena Moseley, B.L., Univ. of Wisc., *Madison.*
English Literature.

John Hiles Moss, LL.B., Univ. of Wisc., *Milwaukee.*
Economics and French.

Mary Isabel Murray, B.L., Univ. of Wisc., *Madison.*
English Literature.

Louis Wescott Myers, B.L., Univ. of Wisc., *Lake Mills.*
Economics.

Fusato Okada, M.A., Kioto Univ., *Tokio, Japan.*
Economics and History.

James Barkley Pollock, B.S., Univ. of Wisc., *Orangeville, Ill.*
Botany and Chemistry.

Henry Riggs Rathbone, B.A., Yale Univ., *Albany, N. Y.*
Economics.

Paul Samuel Reinsch, B.A., Univ. of Wisc., *Madison.*
Civics and English Literature.

Harvey Easton Roberts, Ph.B., Ia. Col., *Postville, Ia.*
Economics.

Winifred Sercombe, B.L., Univ. of Wisc., *Milwaukee.*
History and Economics.

William Bristol Shaw, B.A., M. A., Oberlin Col., *Antigo.*
Economics and History.

Herbert Scott Siggelko, B.A., Univ. of Wisc., *Madison.*
Greek, Elementary Law.

Leonard Sewell Smith, B.C.E., Univ. of Wisc., *Madison.*
Civil Engineering.

Theodore Alexander Stanley, B. S., Univ. of Mich. *New Britain, Conn.*
Dairying and Animal Husbandry.

Edmund Ray Stevens, B.L., Univ. of Wisc., *Janesville.*
History.

Carl Bernard Strōver, Abiturient, Gym. at Minden, *Madison.*
Economics.

Frank Sweet, B.S., Univ. of Wisc., *Milwaukee.*
Electrical Engineering.

William Wesley Young, B.L., Univ. of Wisc., *Monroe.*
History and Economics.

GRADUATES STUDYING IN ABSENTIA.

Andrews Allen, B.C.E., *Wilmington, Del.*
Civil Engineering.
Alice Crawford Baily, B.S., *Des Moines, Iowa.*
English Literature.
William Henry Baily, Ph.B., *Des Moines, Iowa.*
English Literature.
Myron Eugene Baker, B.L., *Cambridge, Mass.*
Philosophy.
George Walker Bliss, B.L., *Dallas City, Ill.*
English and History.
Jacob Michael Bold, B.L. (Eng.), *Bloomingdale.*
Pedagogy.
Elsie L. Bristol, B.L., *Madison.*
English Literature and History.
Byron Beach Carter, B.M.E., *Chicago, Ill.*
Mechanical Engineering.
Eary Saxe Chandler, B.L., *Chicago, Ill.*
English Literature.
Ruth Annie Christie, B.L., *De Pere.*
English Literature.
Kirke Lionel Cowdery, A.B., *Oberlin, Ohio.*
French.
Mary Hazeltine Ela, B.L., *Rochester.*
English Literature.
Howard Greene, B.L., *Milwaukee.*
History.
Frank W. Hall, A.B., *Madison.*
English Literature.
Rosalia Hatherell, B.S., *Platteville.*
Zoology.
William Henry Hopkins, B.L., *Chicago, Ill.*
Hebrew.
Samuel David Huntington, A.B., *Berkeley, Cal.*
French.
James Ross Kaye, A.B., *Kaukaunee.*
Philosophy.
Christian N. Johnson, A.B., *Clinton Junction.*
Pedagogy.
Ruth Marshall, B.S., *Baraboo.*
Zoology.
Charles S. Miller, A.B., *Madison.*
English Literature.

William J. Moroney, B.L., *Dallas, Texas.*
History of Spanish-American Institutions.

George Charles Mors, B.S., *Providence, R. I.*
Mechanical Engineering.

Joseph F. Morse, A.B., B.D., *Denmark, Iowa.*
Economics.

Milton Orlup Nelson, B.L., *Minneapolis, Minn.*
Economics.

William Gray Potter, B.C.E., *Chicago, Ill.*
Civil Engineering.

Gregory John Powell, A.B., B.D., *Omaha, Neb.*
Economics.

Jerome Hall Raymond, A.B., *Appleton.*
Economics and History.

M. Victor Staley, A.B., *New Haven, Con.*
Sanskrit.

Eugene A. Steere, B.S., *Helena, Mont.*
Geology.

Guido H. Stempel, A.B., *Oskaloosa, Iowa.*
German.

Charles Gordon Sterling, A.B., Ph.,P., *Omaha, Neb.*
Hebrew.

George S. Ramsey, M.A., *Albuquerque, New Mexico.*
Economics.

Maude Estelle Remington, B.L., *Baraboo.*
English Literature.

Anna Dinsdale Swenson, B.L., *Chicago, Ill.*
English Literature.

Magnus Swenson, B.M.E., *Chicago, Ill.*
Mechanical Engineering.

Rose Schuster Taylor, B.S., *Sioux City, Iowa.*
History.

Edward Kirby Thomas, B.L., (Eng.), *West Superior.*
English Literature.

Frank A. Updyke, A.B., *Atlanta, Ga.*
Economics.

UNDERGRADUATES.

COLLEGE OF LETTERS AND SCIENCE.

Senior Class.

Abbott, Belle,	*Beloit*,	C. H. (Hist. Group).
Allen, William Ware,	*Madison*,	A. C. (Hist. Group).
Anderson, George Krogh,	*Madison*,	Eng.
Anderson, Otto,	*Chicago, Ill.*,	A. C.
Austin, Charles Francis,	*Bloomington*,	G. S. (Chem. Group).
Baldwin, Charles Leander,	*La Crosse*,	C. H.
Barnes, Flora Anna,	*Prairie du Chien*,	C. H.
Barney, Charles Richard,	*Mauston*,	A. C. (Hist. Group).
Bassett, Agnes Stone,	*Madison*,	M. C.
Beebe, Roy Henry,	*Racine*,	M. C.
Benedict, Derlin Serenus,	*Marshfield*,	A. C. Sp.
Blake, Herbert Scott,	*Racine*,	C. H.
Bleedorn, Bertha,	*Janesville*,	M. C.
Bold, Francis James,	*Madison*,	G. S. (Chem. Group).
Bold, Regina Rosetta,	*Bloomingdale*,	Eng.
Bold, Sadie May,	*Madison*,	C. H. (Hist. Group).
Bowman, Frank Faville,	*Madison*,	Eng.
Brown, Sarah Edith,	*Madison*,	G. S.
Bucknam, Kate Dana,	*Sioux City, Ia.*,	Eng.
Bulfinch, Mary Alice,	*Juda*,	G. S. Sp.
Burgess, Caroline Viola,	*Hitchcock, S. D.*,	C. H.
Carlton, Edward Perkins,	*Madison*,	G. S.
Case, Winifred May,	*N. Greenfield*,	C. H. (Phil. Group).
Clawson, Catherine May,	*Monroe*,	M. C.
Cleveland, Catharine Caroline,	*Oshkosh*,	C. H. (Hist. Group).
Cleveland, Chester Dwight,	*Oshkosh*,	C. H.
Comstock, Adam,	*Madison*,	G. S. (Physics Group).
Cowdery, Edith Aldrich,	*Elkhorn*,	M. C.
Crandall, Harriet Emeline,	*Albion*,	A. C.
Crane, Frank Hurd,	*Beaver Dam*,	G. S. (Chem. Group).
DeCou, Edgar Ezekiel,	*Madison, S. D.*,	G. S.
Dennett, Florence Amanda,	*Baraboo*,	A. C.
Dithmar, Edward Frederick,	*Reedsburg*,	Eng.
Dockery, Harry R.,	*Whitewater*,	Eng. Sp.
Doudna, Pearl Eugene,	*Gillingham*,	M. C. (Math. Group).
Dougan, Wess J.,	*Madison*,	G. S.
Dow, Robert Ninian,	*Cambridge*,	Eng.

Elwell, Percy Spencer,	*La Crosse*,	G. S.
Entemann, Minnie Marie,	*Hartland*,	G. S. (Zool. Group).
Foster, Mary Stewart,	*Madison*,	Eng.
Francis, John Hugh,	*Spring Green*,	G. S.
Freeman, John Dwight,	*Madison*,	G. S.
Gier, Henry Charles,	*Black Earth*,	Eng. Sp.
Graves, Adele Maria,	*Milwaukee*,	M. C.
Hanks, Stanley Charles,	*Madison*,	Eng.
Hayden, Edwin Andrew,	*Oshkosh*,	G. S. (Math. Group).
Hayden, Mary Estella,	*Sun Prairie*,	C. H. (Hist. Group).
Heald, Fred DeForest,	*Madison*,	G. S. (Botany Group).
Henning, Edward Julius,	*Iron Ridge*,	C. H.
Hopkins, Grace Louise,	*Madison*,	M. C.
Howland, Wheeler,	*Ft. Howard*,	C. H.
Hoyt, Miriam,	*Wauwatosa*,	C. H. (Hist. Group).
Jonas, Edward,	*Beaver Dam*,	A. C.
Johnson, Sarah,	*Milwaukee*,	Eng.
Johnston, James Melvin,	*Waupun*,	C. H. (Hist. Group).
Kanneberg, Adolph,	*Ashland*,	Eng.
Kellett, Bertha,	*Neenah*,	Eng.
Kellogg, Helen Julia,	*Madison*,	M. C.
Kinney, Knox,	*Aurora, Ill.*,	C. H.
Kleinpell, Irma Meta,	*Madison*,	M. C.
Kull, Frederic,	*Lake Geneva*,	M. C.
Lamoreux, Courtney Wayland,	*Horicon*,	C. H.
Lawrence, Carl Gustavus,	*Madison*,	M. C.
Light, Gertrude,	*Milwaukee*,	G. S.
Lincoln, Azariah Thomas,	*Montfort*,	G. S. (Min. Group.)
Lindlay, Dena,	*Madison*,	C. H.
MacGregor, George Malcolm,	*Eau Claire*,	G. S.
Madigan, Patrick Henry,	*Madison*,	M. C.
Madigan, Stephen Alexander,	*Madison*,	M. C.
Madison, James Daniel,	*Mazomanie*,	G. S. (Zool. Group).
McGlachlin, Lucy Kate,	*Stevens Point*,	M. C.
Mead, George Wilson,	*Rockford, Ill.*,	A. C.
Meyer, Balthazer Henry,	*Cedarburg*,	Eng.
Moses, Albert Barnes,	*Platteville*,	G. S.
Mueller, Olga,	*La Crosse*,	G. S.
Nelson, Thomas Paine,	*Madison*,	M. C.
Newhouse, William Oscar,	*Clinton*,	C. H.
Noyes, Nellie Strong,	*Oshkosh*,	M. C.
O'Connor, Charles James,	*Madison*,	A. C.

O'Keefe, David Francis,	*Stevens Point*,	Eng.
Overson, Willard Bela,	*Cambridge*,	C. H.
Parker, Warren Downes,	*Madison*,	G. S (Geol. Group).
Parsons, Ada Martha,	*Milwaukee*,	Eng. (Math. Group).
Pellow, Anna,	*Edmund*,	Eng.
Pendleton, Edmund,	*Sioux City, Ia.*.	M. C.
Pomainville, Frank,	*Grand Rapids*,	G. S. Sp.
Pratt, John Alexander,	*Stoughton*,	C. H.
Regan, Susy Pierce,	*Madison*,	M. C.
Reilly, Michael Kiernan,	*Fond du Lac*,	C. H.
Rienow, Robert,	*Prairie du Chien*,	C. H.
Roberts, Eliza,	*Hazel Green*,	G. S.
Robinson, Mabel Porter,	*Milwaukee*,	M. C.
Rountree, Nellie Jewett,	*Platteville*,	Eng.
Rowan, Patrick,	*Madison*,	M. C.
Sarles, Jesse Eugene,	*Boscobel*,	A. C.
Schafer, Joseph,	*Muscoda*,	C. H.
Schlundt, Herman,	*Two Rivers*,	G. S.
Seymour, Arthur Romeyn,	*Reedsburg*,	M. C.
Short, Ward Beecher,	*Dodgeville*,	Eng.
Smart, Edward Matthew,	*Almond*,	Eng.
Smith, Alonzo Roswell,	*Sparta*,	M. C.
Smith, Etta Milton,	*Mineral Point*,	C. H.
Spooner, Willett Main,	*Madison*,	A. C.
Stephenson, Alice Elizabeth,	*Madison*,	M. C.
Stiles, Minnie Margaret,	*Columbus*,	M. C.
Strong, Anna May,	*Mineral Point*,	G. S. (German Gr).
Taylor, Ada Elizabeth,	*Milwaukee*,	Eng.
Terry, Grace Larkin,	*Madison*,	Eng.
Tidyman, Melvin,	*Waupun*,	C. H.
Vilas, Henry,	*Madison*,	A. C.
Walker, Mary Ada,	*Stevens Point*,	M. C.
Webster, John Enoch,	*Stevens Point*,	G. S. (Physics Gr).
Weidman, Samuel,	*Ableman*,	G. S. (Geol. Group).
White, Harry K.,	*Sparta*,	Eng.
Wilson, George Smith,	*Madison*,	C. H.
Wyman, Anna Imogene,	*Eau Claire*,	M. C.
Youker, Henry Sherwood,	*Waterloo*,	G. S.
Young, Caroline Morris,	*Madison*,	M. C.

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Junior Class.

Allen, Cora,	*Madison*,	Eng.
Allen, Harry Eugene,	*Madison*,	G. S.
Armstrong, Mary,	*Portage*,	G. S.
Aylward, Richard Charles,	*Black Earth*,	G. S. Sp.
Baker, Helen Augusta,	*Madison*,	A. C.
Ball, Farlin Herbert,	*Oak Park, Ill.*,	A. C.
Ball, Wilbur Laing,	*Madison*,	A. C.
Barber, Frank William,	*Christie*,	Eng.
Beffel, John Marshall,	*Racine*,	G. S. (Zool. Group).
Blakely, Thomas Thurston,	*Janesville*,	C. H. Sp.
Bolton, Herbert Eugene.	*Tomah*,	C. H.
Brown, Helen Lucy,	*Stevens Point*,	M. C.
Brown, William Owen,	*Sturgeon Bay*,	G. S.
Buckley, Ernest Robertson,	*Tomah*,	G. S. (Geol. Group).
Bunting, Alice Isabella,	*La Crosse*,	A. C.
Burton, George,	*Annaion*,	G. S.
Cady, Samuel Howard,	*Madison*,	M. C. Sp.
Cairns, Gertrude Maud,	*Ellsworth*,	M. C.
Callecod, Ole Larson,	*Madison*,	Eng. Sp.
Carhart, Arthur,	*Milwaukee*,	G. S.
Cassells, Edward Henry,	*Tomah*,	A. C.
Chynoweth, Edna Ruth,	*Madison*,	M. C. (Hist. Group).
Copeland, Edwin Bingham,	*Monroe*,	G. S. (Botany Group).
Cramer, Mary Allison,	*Madison*,	M. C.
Crommett, Hebert Benton,	*Star Prairie*,	G. S.
Cunningham, Wilson,	*Cobb*,	G. S.
Dodson, Samuel Henry,	*Madison*,	C. H. Sp.
Ebersole, Abram,	*Sterling, Ill.*,	A. C.
Edgren, Dottie Josephine,	*Madison*,	M. C.
Ellsworth, Laura,	*Barron*,	G. S. (Zool. Group).
Everett, Mary Louise,	*Oshkosh*.	M. C.
Fairchild, Albert Turner,	*Marinette*,	A. C.
Falvey, Katherine Mary,	*Baraboo*,	Eng.
Ferris, William Chester,	*Waupun*,	C. H.
Flint, Anna Catherine,	*Menomonie*,	Eng.
Ford, Guy Stanton,	*Plainfield, Ia.*,	C. H.
Ford, Marcus Clizbee,	*Madison*,	Eng. Sp.
Foster, Guy Leroy,	*Madison*,	Eng. Sp.
Frazier, Charles Ross,	*Madison*,	C. H.
Fulton, Grace,	*Hudson*,	C. H.
Gale, Zona,	*Portage*,	M. C. Sp.

Gittins, Elmer Elsworth,	*Racine*,	Eng. Sp.
Goodell, Richard Albert,	*Ipswich*,	Eng.
Graves, William Roswell,	*Boscobel*,	C. H.
Gray, Alfred William,	*Milwaukee*,	A. C.
Green, Grace Nellie,	*Monroe*,	M. C.
Greenbank, George Herbert,	*Madison*,	M. C.
Griffiths, Anna Cecilia,	*Madison*,	A. C.
Hallowes, Clara Louise,	*Madison*,	G. S.
Hamilton, Harry David,	*Sioux City, Ia.*,	Eng. Sp.
Hand, Jessie Louise,	*Racine*,	M. C.
Harder, Herman Peter,	*New Holstein*,	G. S. (Zool. Group).
Harris, J. Earl,	*Reedsburg*,	G. S.
Harris, Juliet Parker,	*Reedsburg*,	Eng.
Henderson, Bertina,	*Cambridge*,	Eng. Sp.
Herrmann, Charles,	*Sterling, Ill*,	G. S.
Hicks, Ernest Levi,	*Oshkosh*,	G. S.
Higgins, James Martin,	*Madison*,	A. C. Sp.
Hodges, Frank Lewis,	*Monroe*,	G. S.
Holt, Robert Lincoln,	*Caldwell*,	C. H.
Hough, Alexander George,	*Racine*,	G. S. (Phil. Group).
Ives, Guy,	*Black Earth*,	Eng. Sp.
Jones, Charles Wickham,	*Dodgeville*,	C. H.
Jones, Noble Wiley,	*Red Wing, Minn.*,	G. S.
Judge, Ina,	*Darlington*,	Eng.
Kimball, Bertha Clough,	*Madison*,	G. S.
Kimball, Edna Gertrude,	*Madison*,	M. C. Sp.
Kingsley, George Almond,	*Madison*,	A. C.
Luetscher, John Arthur,	*Sauk City*,	C. H.
Lyle, Edith Kathryn,	*Madison*,	C. H. (Hist. Group).
Lyon, Edith Adel,	*Sioux City, Ia.*,	M. C.
MacGregor, Nellie Bly,	*Eau Claire*,	M. C.
Main, Annie Elizabeth,	*Madison*,	M. C.
Mandt, Clara Josephine,	*Stoughton*,	Eng. Sp.
Marshall, Victor Fred,	*Appleton*,	G. S.
Mason, Vroman,	*Madison*,	C. H.
Maynard, Myra Edith,	*Hawaden, Ia.*,	M. C. Sp.
McGregor, Margaret Elizabeth,	*Stevens Point*,	M. C. Sp.
McMinn, Amelia,	*Chicago, Ill.*,	C. H.
McWhorter, J. Scott.	*Buckhannon, W. V.*,	Eng. (Phil. Group).
Meinhardt, Antoinette Marie,	*Burlington*,	G. S.
Menke, Henry Jr.,	*DeWitt, Neb.*,	Eng. (Phil. Group).
Mills, Elizabeth Bennett,	*Madison*,	G. S.
Norton, Irene Celia,	*Elkhorn*,	M. C. Sp.

O'Connor, Lenore Frances,	*Madison*,	M. C.
Olson, Oscar Alexander,	*Chicago, Ill.*,	G. S.
O'Neil, George Edwin,	*Milwaukee*,	C. H.
Palmer, Elizabeth Marshall,	*Madison*,	Eng. Sp.
Parman, Ida Lillian,	*Mazomanie*,	M. C. Sp.
Pendleton, Mary Lucy,	*Sioux City, Ia.*,	M. C.
Peterson, Fred William,	*Bonduel*,	A. C.
Pierce, Frank Ellis,	*Pittsburg, Pa.*,	G. S. Sp.
Pomeroy, Flavia Marie,	*Edgerton*,	Eng.
Pretts, William Walter,	*Platteville*,	G. S.
Prevey, Commodore E.	*Elroy*,	C. H.
Reindahl, Amund Kittelsen,	*Madison*,	M. C. Sp.
Richardson, Helen Cornelia,	*Sparta*,	M. C. (Math. Group).
Richardson, Julia Baker,	*Davenport, Ia.*,	M. C. Sp.
Robinson, Edith Porter,	*Milwaukee*,	M. C. Sp.
Ross, Gertrude Clark,	*Sioux City, Ia.*,	M. C.
Ryan, John Elbert,	*Andover*,	C. H. Sp.
Salisbury, Oliver Maxson,	*Whitewater*,	G. S.
Schaper, William August,	*St. Joseph*,	C. H.
Scheibel, Martha C.,	*Madison*,	M. C.
Schuette, Albert B.,	*Manitowoc*,	C. H.
Sheldon, George Matthew,	*Brandon*,	Eng. Sp.
Shepherd, Jessie May,	*Madison*,	M. C.
Silverwood, Thomas P.,	*Sumner*,	G. S.
Simons, Algie Martin,	*Baraboo*,	C. H. (Econ. Group).
Smith, Marietta Baldwin,	*Racine*,	C. H.
Smith, Ralph Elbert,	*Waupun*,	C. H.
Spensley, Calvert Frederick,	*Mineral Point*,	A. C.
Spensley, Harker George	*Mineral Point*,	G. S. Sp.
Spiegelberg, Elizabeth,	*Boscobel*,	M. C. Sp.
Steenberg, Bessie,	*Waupaca*,	M. C. Sp.
Steensland, Halbert Severin,	*Madison*,	G. S.
Swiler, George Christopher,	*Delavan*,	A. C. Sp.
Tarnutzer, Anna Elizabeth,	*Madison*,	G. S. Sp.
Ten Eyck, Lena Amelia,	*Brodhead*,	C. H.
Thomas, Carolina Eames,	*Green Bay*,	M C.
Thomas, Frederick Willis,	*Eau Claire*,	C. H.
Thompson, Alva Allen,	*Tomah*,	G. S.
Thorp, Mary Isabella,	*Madison*,	M. C.
Tillotson, Roy Delancy,	*Waupun*,	C. H. (Math. Group).
Tormey, James Albert,	*Richland Center*,	Eng.
*Tratt, Walter Frank,	*Whitewater*,	C. H. Sp.

* Deceased.

Van Vleet, Albert H.,	*Nickerson, Kans.*,	G. S.
Vernon, Florence Eugenia,	*Madison*,	M. C.
Wagner, Frederick,	*Freeport, Ill.*,	Eng.
Waldbridge, Fanny Rose,	*Madison*,	Eng. Sp.
Warren, Clyde Lafayette,	*Green Bay*,	M. C.
Webster, Frank B.,	*Pleasant Valley*,	C. H.
Welles, Frances Brodley,	*Milwaukee*,	G. S.
Winter, Herman,	*Madison*,	M. C.
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Sophomore Class.

Alsted, Lewis Losey,	*Milwaukee*,	C. H.
Amazeen, John Brown,	*Milwaukee*,	A. C.
Arndt, Walter Tallmage,	*Superior*,	C. H. Sp.
Atwood, Janette,	*Madison*,	Eng. Sp.
Bacon, Gertrude Montague,	*Milwaukee*,	M. C. Sp.
Barton, Albert,	*Mount Vernon*,	Eng. Sp.
Beebe, Paul Arthur,	*Marshall*,	G. S. Sp.
Bleyer, Willard Grosvenor,	*Milwaukee*,	M. C.
Blomgren, Charles Edwin,	*Chicago, Ill.*,	G. S. Sp.
Boese, Herman Rudolph,	*Beaver Dam*,	Eng.
Bolton, William Lawrence,	*Racine*,	C. H.
Bostwick, Eva Huling,	*Janesville*,	M. C.
Bowden, Josephine Horton,	*West Salem*,	Eng.
Brauer, Hermann G. A.,	*Madison*,	C. H. Sp.
Brazeau, Theodore Walter,	*Grand Rapids*,	Eng Sp.
Bucey, Caro Louise,	*Madison*,	M. C.
Bump, Franklin Elisha,	*Wausau*,	C. H. Sp.
Bunting, Charles Henry,	*La Crosse*,	G. S.
Burgess, Ezra Ray,	*Racine*,	C. H.
Bushnell, Ida May,	*Burlington*,	M. C. Sp.
Carlton, Mary Louise,	*Madison*,	C. H.
Chase, Effie Augusta,	*Sioux City, Ia.*,	M. C. Sp.
Conway, William James,	*Rudolph*,	Eng. Sp.
Copeland, Herbert Bingham,	*Madison*,	C. H. Sp.
Copeland, Louis Albert,	*Shullsbury*,	Eng. Sp.
Cornish, Francis Vincent,	*Myrna, Minn.*,	C. H.
Craig, Jessie Catherine,	*Russell, Ontario*,	Eng. Sp.
Crooker, Orin Edson,	*Helena, Mont.*,	G. S. Sp.
Crowley, Francis Morton,	*Madison*,	G. S. Sp.
Curtis, Alfred Tennyson,	*Madison*,	C. H. Sp.
Daniells, Ralph Peabody,	*Madison*,	G. S. Sp.

Davison, Thomas Lincoln,	*Waupun*,	Eng. Sp.
Dolph, Cyrus,	*Brookfield*,	C. H.
Donohue, Michael Joseph,	*Antigo*,	G. S. Sp.
Doyle, Francis Eleanor,	*Madison*,	Eng.
Eager, Gertrude,	*Evansville*,	M. C. Sp.
Ellingsen, Peter Martin,	*Amos*,	Eng. Sp.
Fehr, Henry,	*Milwaukee*,	G. S.
Fehr, Jacob, Jr.,	*Milwaukee*,	C. H.
Fox, George William,	*Madison*,	G. S. Sp.
Frame, William Somerville,	*Waukesha*,	C. H.
Freeman, Charlotte Brockway,	*Madison*,	M. C.
Gallagher, Sadie Ellen,	*Madison*,	Eng.
Gile, Durante Carlyle,	*Madison*,	A. C.
Gillen, Martin James,	*Racine*,	C. H.
Gordon, James Curtis,	*Madison*,	G. S.
Guenther, Laura Marion,	*Madison*,	Eng.
Guile, Ella May,	*Wauwatosa*,	G. S.
Hambrecht, George Philip,	*Lake Geneva*,	C. H.
Harding, Harry Alexis,	*Brodhead*,	G. S.
Hardy, Charles Albert,	*La Crosse*,	C. H. Sp.
Haviland, Dora Luella,	*Janesville*,	M. C.
Hayden, Georgia H.,	*Eau Claire*,	M. C.
Healy, James Thomas,	*Beaver Dam*,	Eng.
Hewitt, Harry Brewer,	*Menasha*,	Eng. Sp.
Hocking, William Joseph,	*Darlington*,	C. H.
Iverson, Edward Alvin,	*Chicago, Ill.*,	G. S. Sp.
James, Victoria,	*Eau Claire*,	M. C. Sp.
Johns, William Henry,	*Dodgeville*,	Eng. Sp.
Johnson, Ellen,	*McFarland*,	Eng.
Jones, David R.,	*Waterville*,	A. C.
Jones, Lillian A.,	*Racine*,	M. C. Sp.
Jones, Thomas R. Lloyd,	*Hillside*,	G. S.
Kalaher, Michael William,	*Lake Geneva*,	C. H. Sp.
Katzenstein, George,	*Milwaukee*,	G. S.
Kennicott, Belle,	*Madison*,	M. C. Sp.
Kittell, John Albert,	*De Pere*,	C. H.
Ladd, Nels Albert,	*Stoughton*,	Eng. Sp.
Lanphier, Phoebe Anne,	*Janesville*,	M. C.
Leith, Charles Kenneth,	*Madison*,	G. S. Sp.
Liegler, John Henry,	*Racine*,	C. H.
Lucas, Frank Warren,	*Brodhead*,	M. C.
Lyon, Judd Stuart,	*Sioux City, Ia.*,	M. C. Sp.
Maine, Ellen Lucy,	*Stevens Point*,	M. C. Sp.

Maloney, David William,	*Elk Creek*,	C. H.
McCard, Henry Stanton,	*Rockford, Ill.*,	G. S.
McCoy, Mabel,	*Lancaster*,	C. H.
McNab, Joseph Lowe,	*Evanston, Ill.*,	C. H. Sp.
McVicar, Mary C.,	*Madison*,	M. C. Sp.
Medberry, Fannie Knapp,	*Oshkosh*,	Eng.
Miller, Florence Emaretta,	*Madison*,	Eng. Sp.
Miller, George Harry,	*Winneconne*,	A. C.
Mitchell, Andrew William,	*Chicago, Ill.*,	A. C. Sp.
Newbury, Lila Dora,	*Sparta*,	M. C. Sp.
Nichols, Augusta Mae,	*Madison*,	M. C.
Noyes, Harry Jennings,	*Milwaukee*,	C. H.
Ochsner, Benjamin James,	*Prairie du Sac*,	G. S.
Page, Jay W.,	*Honey Creek*,	C. H.
Palmer, Helen,	*Madison*,	M. C. Sp.
Paul, Alexander Gunn,	*La Crosse*,	Eng. Sp.
Peters, Susie Mary,	*Watertown*,	Eng.
Phelps, Charles Austin,	*Madison*,	M. C.
Phipps, Cranston George,	*Milwaukee*,	C. H. Sp.
Pierce, Alice Darlington,	*Sioux City Ia.*,	M. C. Sp.
Pitman, Anna Marie,	*Madison*,	A. C.
Richards, John Robertson,	*Lake Geneva*,	C. H. Sp.
Ruddick, Richard Albert,	*Ingersoll, Ont.*,	A. C.
Sanborn, John Bell,	*Madison*,	M. C. Sp.
Sawyer, Hiram Arthur,	*Hartford*,	Eng.
Schaeffer, Katherine Louise,	*Somers*,	M. C. Sp.
Schmidt, Albert Henry,	*Manitowoc*,	C. H.
Scouler, William Foster,	*Picketts*,	G. S. Sp.
Shearer, Blanche,	*Green Bay*,	M. C. Sp.
Sheldon, Walter Hodge,	*Madison*,	A. C.
Shockley, Harlow Orville,	*Lamont*,	G. S.
Showerman, Grant,	*Brookfield*,	A. C.
Shuart, Charles Day,	*Kenosha*,	G. S.
Skinner, Frank Norborne,	*Redfield, O.*,	G. S. Sp.
Smith, Carrie Frederica,	*Madison*,	M. C.
Smith, Charles Marquis,	*Racine*,	G. S.
Smith, Elizabeth Church,	*Woodstock, Ill.*,	Eng.
Somerville, Frank William,	*Waukesha*,	C. H.
Sparks, Laura Verne,	*Beloit*,	M. C.
Spence, Mary,	*Fond du Lac*,	A. C.
Stair, Robert Preston,	*Ft. Atkinson*,	G. S. Sp.
Suydam, Vernon Andrew,	*Rural*,	G. S.
Sweetnam, Edward William,	*Cedarburg*,	Eng.

Tallman, William Duane,	*Madison*,	G. S. Sp.
Tarrant, Shirley Brooks,	*Durand*,	C. H.
Thomas, James E.,	*Delafield*,	A. C.
Thompson, George,	*Oconto*,	G. S.
Thompson, Thomas S.,	*Mount Horeb*,	C. H.
Torgerson, Martha Florence,	*Madison*,	M. C.
Urdahl, Margerethe,	*Madison*,	M. C.
Ward, Louis Merrick,	*Milwaukee*,	C. H.
Warning, Anna,	*Elkhorn*,	M. C.
Wehmhoff, Emma C. Fredericka,	*Burlington*,	M. C.
Welsh, Iva Alice,	*Madison*,	C. H.
Westover, Calla Phœbe,	*Madison*,	G. S.
Witter, Isaac Phelps,	*Grand Rapids*,	C. H. Sp.
Witter, Ruth Emily,	*Grand Rapids*,	Eng. Sp.
Wolcott, John Dorsey,	*Penn Yan, N. Y.*,	A. C.
Wootton, Addimay,	*Madison*,	M. C.
Worden, Lucien Robson,	*Milwaukee*,	Eng. Sp.
Wright, Albert Orville, Jr.,	*Madison*,	M. C.
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Freshman Class.

Armstrong, John Spurr,	*Madison*,	C. H.
Atwell, Rawlins,	*Milwaukee*,	Eng.
Atwood, Augusta,	*Madison*,	Eng.
Atwood, David,	*Madison*,	M. C. Sp.
Bacon, John Harwood,	*La Crosse*,	M. C.
Ball, Otho Fisher,	*Waterloo, Iowa*,	G. S.
Barker, Mary Rogers,	*Janesville*,	C. H.
Barling, Ada May,	*Milwaukee*,	Eng. Sp.
Barnett, James Morris,	*Neenah*,	G. S.
Bartz, John Paul,	*Fall Creek*,	A. C.
Beaumont, Julia,	*Green Bay*,	Eng. Sp.
Becker, C. Lotus,	*Waterloo, Iowa*,	C. H.
Benson, Gideon,	*Richland Center*,	G. S. Sp.
Berryman, Clara Maud,	*Madison*,	M. C. Sp.
Bertles, Mary Ione,	*Green Bay*,	M. C.
Blackburn, Thomas Brodgen,	*Omro*,	C. H.
Bonner, Nelson,	*Fox Lake*,	Eng.
Bowler, Edward R.,	*Sparta*,	C. H. Sp.
Brand, Bessie Goodrich,	*Madison*,	M. C., Sp
Brayton, Aaron Martin,	*La Crosse*,	C. H. Sp.

Brewer, Chester Leland,	*Evansville,*	M. C.
Briesen, Elizabeth Johana v.,	*Columbus,*	M. C.
Briesen, Julia Hattie v.,	*Columbus,*	M. C.
Broughton, William Simmons,	*Dwight, Ill.,*	C. H.
Butt, Cyrus Marion, Jr.,	*Viroqua,*	C. H.
Cairns, Rolla Ullin,	*Ellsworth,*	A. C. Sp.
Cantwell, Joseph Michael,	*Madison,*	C. H.
Carlton, Alice Elizabeth,	*Madison,*	C. H. Sp.
Carney, Mary Winifred,	*Eau Claire,*	M. C. Sp.
Case, Henry Cadby,	*Milwaukee,*	C. H.
Chandler, Albert James,	*Ladoga,*	Eng.
Chapman, Bertha Estella,	*Plainfield,*	Eng.
Chase, Albert Guy,	*Ladoga,*	Eng.
Clausen, Fred Herald,	*Fox Lake,*	Eng.
Cochems, Henry,	*Sturgeon Bay,*	Eng.
Coe, Joseph Spaulding,	*Whitewater,*	M. C.
Cohen, Walter John,	*Milwaukee,*	G. S.
Comstock, Elizabeth,	*Madison,*	G. S.
Corscot, Kate May,	*Madison,*	A. C.
Cushing, Alice Gertrude,	*Wauwatosa,*	C. H.
Davis, Grace Agnes,	*Rockford, Ill.,*	C. H. Sp.
Dengler, Rose,	*Madison,*	Eng.
Dern, Henry Joseph,	*Wausau,*	G. S. Sp.
Dickinson, Carrie,	*Neillsville,*	Eng.
Dodge, Helen Frances,	*Sparta,*	M. C.
Dorr, Frank Berry,	*Shullsburg,*	C. H. Sp.
Dow, Ethel,	*Stoughton,*	Eng. Sp.
Downer, George Ford,	*Lake Geneva,*	C. H.
Doyon, Bertrand Herrick,	*Madison,*	C. H.
Eberlein, Frederick August,	*Shawano,*	C. H.
Edwards, Clarence Bushnell,	*Lancaster,*	C. H.
Evans, Evan Alfred,	*Spring Green,*	Eng.
Everett, Julia Franklin,	*Madison,*	G. S. Sp.
Fairchild, Arthur Wilson,	*Marinette,*	M. C.
Ferguson, Herbert Thomas,	*Waupun,*	C. H.
Fish, Victoria,	*Madison,*	M. C. Sp.
Ford, William Brown,	*Sparta,*	G. S.
Freeman, Charles Fischer, Jr.,	*Milwaukee,*	C. H.
Fries, Mary Belle,	*Richland Center,*	Eng.
Gannon, Walter Scott,	*Cedarburg,*	C. H.
Garrett, Hattie May,	*Auburn, N. Y.,*	C. H. Sp.
Gernon, Bessie,	*Madison,*	Eng.
Gibbons, Florence Rosina,	*Sun Prairie,*	G. S. Sp.

Gilbertson, Julius George,	*Eau Claire*,	C. H.
Giss, August John,	*Sauk City*,	G. S.
Goldsmith, Meta Emily,	*Milwaukee*,	M. C.
Goodwin, Iva Frances,	*Madison*,	Eng.
Gould, Harry Graham,	*Oshkosh*,	G. S. Sp.
Graham, John Gray,	*Tomah*,	M. C.
Green, John Sherman,	*Milwaukee*,	C. H. Sp.
Greenwood, Charles Sheen,	*Lake Mills*,	Eng.
Griffiths, Mayme Edna,	*Madison*,	M. C.
Gurnee, Paul Dennison,	*Madison*,	Eng.
Haecker, Elfrida Frances,	*St. Anthony Park, Minn.*,	Eng. Sp.
Hageman, Charles Frederick,	*Mauston*,	A. C. Sp.
Hanson, Edward Smith,	*Monroe*,	M. C. Sp.
Harris, Margaret Davidson,	*Appleton*,	C. H.
Hart, Catherine Beatrice,	*Madison*,	C. H.
Harvey, William Thomas,	*Racine*,	G. S.
Hase, William Frederick,	*Milwaukee*,	C. H.
Herrick, Benjamin Arlington,	*Madison*,	C. H.
Heyn, Bernard Goldsmith,	*Milwaukee*,	C. H.
Higgins, Allen Fitch,	*Sturgeon Bay*,	G. S. Sp.
Hodges, Arthur,	*Chicago, Ill.*,	A. C. Sp.
Holton, Julius,	*Utica*,	Eng. Sp.
Hoppmann, August Charles,	*Madison*,	Eng. Sp.
Houghton, Anna Pauline,	*Racine*,	Eng. Sp.
Hoyt, Frank Alfred,	*Sioux City, Iowa*,	M. C. Sp.
Hoyt, Heber Bishop,	*Waterloo*,	Eng.
Hughes, Walter Wellington,	*New Lisbon*,	C. H.
Jackman, Ralph Wilmerth,	*Janesville*,	C. H.
Jackson, Reginald Henry,	*Madison*,	G. S. Sp.
Jackson, Russell,	*Madison*,	A. C.
Janes, Gertrude,	*Tunnel City*,	Eng.
Jefferson, Clara Smith,	*Madison*,	Eng
Jenny, Adaline Miriam,	*Boscobel*,	A. C Sp.
Jones, Clara,	*West Bend*,	Eng
Jones, Nettie,	*Arena*,	Eng.
Jones, Richard Lloyd,	*Chicago, Ill.*,	C. H.
Kennedy, Sidney Robinson,	*Brooklyn, N. Y.*,	G. S. Sp.
Kilbourn, Robert Allen,	*Lancaster*,	C. H.
King, Elizabeth,	*Spring Green*,	G. S. Sp.
Kronshage, Ernest Hildebrand,	*Boscobel*,	A. C. Sp.
Krueger, Frederick Charles,	*Sun Prairie*,	G. S. Sp.
Laflin, Mary Luella,	*Milwaukee*,	M. C.
Laube, Frank Joseph,	*Brodhead*,	Eng.

Lea, Charles Winthrop,	*Waupaca*,	C. H.
Libbey, Charles Arthur,	*Oshkosh*,	C. H.
Liebenberg, Herman Henry,	*Waumandee*,	G. S. Sp.
Link, George Martin,	*Leon*,	C. H.
Lockney, Henry,	*Waukesha*,	C. H.
Loomis, Grace,	*La Crosse*,	G. S.
Luby, Clarence Joseph,	*Hurley*,	Eng. Sp.
Lynch, Elsie Josephine,	*Huron, S. D.*,	C. H. Sp.
Lynch, John Kinney,	*Oshkosh*,	C. H.
Mabbett, Leora Esther,	*Edgerton*,	Eng.
Mann, William Henry,	*Marinette*,	M. C.
Manson, Hubert Hayes,	*Wausau*,	C. H.
Markham, Henry Stuart,	*Milwaukee*,	G. S.
Marlow, John Anthony,	*Decorah, Ia.*,	M. C.
McCormac, Eugene Irving,	*Sumner, Ia.*,	C. H. Sp.
McCulloch, Isabella Jane,	*Janesville*,	C. H.
McFetridge, Georgiana,	*Baraboo*,	M. C.
McGilvra, Avis Aurelia,	*Baraboo*,	M. C.
McGraw, Mattie Edythe,	*Chippewa Falls*,	M. C. Sp.
McLenegan, Annie S.,	*Beloit*,	M. C. Sp.
McNown, Clara Isabel,	*Mauston*,	Eng. Sp.
McVicar, Agnes Edna,	*Madison*,	M. C. Sp.
McVicar, Katherine Eunice,	*Madison*,	M. C.
Melville, Naomi Earlhart,	*Davenport, Ia.*,	M. C.
Meyer, George William,	*Madison*,	C. H. Sp.
Middlekauff, Luella,	*Polo, Ill.*,	Eng. Sp.
Miller, John Oscar,	*Marinette*,	A. C.
Mitchell, Howard Edwin,	*Milwaukee*,	C. H.
Montgomery, Charles Carroll,	*Omaha, Neb.*,	A. C.
Morey, Ida Louisa,	*Chippewa Falls*,	Eng.
Morley, Ralsa Fred,	*Baraboo*,	C. H. Sp.
Murat, Leroy John,	*Stevens Point*,	C. H.
Musser, Walter Chambers,	*Monroe*,	C. H.
Nash, Guy,	*Centralia*,	G. S.
Nash, Nellie Irene,	*Centralia*,	C. H.
Newbre, Alice Katherine,	*Chicago, Ill.*,	C. H. Sp.
Newbre, Edna May,	*Chicago, Ill.*,	C. H.
Newton, Mary Lucinda,	*Eau Claire*,	M. C. Sp.
Norton, William Clarence,	*Elkhorn*,	C. H. Sp.
O'Brien, Rose Anna,	*Elkhorn*,	M. C.
Oestreich, Otto August,	*Kewaunee*,	C. H.
Osborne, Laura Alma,	*La Crosse*,	M. C.
Park, Ernest Sprague,	*Des Moines, Ia.*,	G. S. Sp.

Parkinson, Eva,	*Madison*,	A. C.
Parkinson, Fay,	*Columbus*,	M. C.
Parkinson, Maude,	*Madison*,	A. C.
Parsons, Frederick Francis,	*Berlin*,	C. H.
Pengra, Charlotte Elvira,	*Madison*,	Eng.
Perkins, Henry Addison,	*Sioux City, Ia*,	M. C. Sp.
Pittman, Matthias Bovee, Jr.,	*Boscobel*,	C. H.
Pound, Martha Edith,	*Madison*,	M. C.
Powell, William Anson,	*La Crosse*,	C. H. Sp.
Proctor, Ino Mary,	*De Pere*,	Eng. Sp.
Pyre, Walton Hawkins,	*Madison*,	M. C.
Ramien, Richard Bruno,	*Milwaukee*,	C. H.
Rehn, Valentine Lawrence,	*Marshall*,	C. H.
Rickfort, William Otto,	*Lake Mills*,	G. S.
Risjord, Gullick Nelson,	*Mt. Horeb*,	C. H.
Rockney, Thomas,	*Cambridge*,	Eng. Sp.
Rogers, John Jay,	*Wauwatosa*,	G. S.
Rogers, Selden Wallace,	*Portage*,	C. H.
Sames, Ellen Daisy,	*Rockford, Ill.*,	Eng. Sp.
Sawyer, Philetus Horace,	*Oshkosh*,	C. H.
Schoenfield, William David,	*Monroe*,	A. C. Sp.
Schreiber, Lucile Howard,	*Milwaukee*,	M. C.
Serl, Elmer Willis,	*Delavan*,	G. S.
Sexton, Andrew Reynolds,	*Madison*,	A. C. Sp.
Sheldon, Shepard L.,	*Janesville*,	M. C.
Shinnick, Thomas Francis,	*Watertown*,	G. S.
Sikes, George Rubens,	*Sharon*,	A. C.
Silber, Effie May,	*Milwaukee*,	Eng. Sp.
Simcock, George Henry,	*Antigo*,	G. S. Sp.
Smelker, Roy C.,	*Dodgeville*,	Eng.
Smieding, George,	*Racine*,	G. S.
Smith, Edna E.,	*Amherst*,	Eng.
Smith, Ernest Bradford,	*Madison*,	M. C.
Smith, Mary Emily,	*Wausau*,	G. S.
Snyder, William Edwin,	*Beaver Dam*,	G. S.
Spence, Caroline Devereaux,	*Fond du Lac*,	A. C.
Spence, Gertrude,	*Fond du Lac*,	G. S.
Stavrum, Ernst Arthur,	*La Crosse*,	M. C. Sp.
Steadwell, Bert,	*Mazomanie*,	C. H.
Stowe, William Arthur Lovel,	*Neenah*,	G. S. Sp.
Strock, Linius Lehmann,	*Sterling, Ill.*,	A. C. Sp.
Sutherland, Adda Irene,	*Madison*,	Eng. Sp.

Terwilliger, Mabel,	*Oregon*,	Eng.
Thomas, Sarah Jennie,	*Delafield*,	M. C.
Thompson, Cora Amanda Marie,	*Beloit*,	M. C. Sp.
Thomson, Fred,	*Tomah*,	C. H. Sp.
Thorp, Louisa Maud,	*Madison*,	M. C. Sp.
Tillotson, Earle Clarence,	*Baraboo*,	M. C.
Torbe, Leo,	*Milwaukee*,	C. H. Sp.
Virgin, Georgie Irene,	*Platteville*,	M. C.
Waite, Ossian Thomas,	*Oshkosh*,	C. H.
Walker, Bert James,	*Plainfield*,	Eng.
Walker, Charles Augustus,	*Plainfield*,	Eng.
Whitman, Eugene Rodolph,	*Lancaster*,	G. S.
Willison, Ernest Martin,	*Madison*,	C. H.
Wright, David Howard, Jr.,	*Madison*,	G. S. Sp.
Wright, Grace Anna,	*Janesville*,	C. H.
		= 206

ADULT SPECIAL STUDENTS.

Andrus, William Terrill,	*Reedsburg.*
ApRoberts, Percy,	*River Falls.*
Bassett, Mary Griswold,	*Madison.*
Bohrer, Rosalia,	*Washburn.*
Calmody, Patrick John,	*Mount Hope.*
Chapman, Annie,	*Madison.*
Clawson, Sadie Marie,	*Brodhead.*
Darrow, William,	*Yellowstone.*
Dutcher, Adelaide,	*Madison.*
Heinemann, Gustavus Nathaniel,	*Wausau.*
Henderson, Margaret,	*Cambridge.*
Janes, Elma Lucretia,	*Waukesha.*
Kennedy, Richard Vincent,	*Westport.*
Latton, Arthur Joseph,	*Medford.*
Lewis, Martin,	*Perry.*
Long, Paul Manley,	*Sun Prairie.*
Mead, Ruth Titcomb,	*Madison.*
Moore, Russell Andrew,	*Fountain City.*
Obenhaus, Hermann Frederick Arnold,	*Prescott.*

Phillips, Charles Michael,	*Bluford, Ill.*	
Phillips, Henrietta,	*Sun Prairie.*	
Reilly, James Patrick,	*Fond du Lac.*	
Rowan, Frank Joseph,	*Oak Creek.*	
Schneider, Karl,	*Madison.*	
Sheldon, Mary Roby,	*Madison.*	
Siggelko, Winifred,	*Madison.*	
Stamp, George,	*Parkston, S. D.*	
Tyner, Paul,	*Madison.*	
Zollinger, Etta May,	*Waldwick.*	=29

COLLEGE OF MECHANICS AND ENGINEERING.

Senior Class.

Arms, Richard Myron,	*Randolph,*	E. E.
Baehr, William Alfred,	*Oshkosh,*	C. E.
Biefeld, Paul A.,	*Watertown,*	E. E.
Bird, Hobart Stanley,	*Madison,*	C. E.
Boardman, Horace Prentiss,	*Parsons, Kans.,*	C. E.
Brennan, William Michael,	*Cato,*	C. E.
Evans, Edward Milton,	*Racine,*	C. E.
Evans, George Benjamin,	*Spring Green,*	C. E.
Hansen, Oscar,	*Kenosha,*	E. E.
Humphrey, Edgar P.,	*Madison,*	C. E. Sp.
Kirchoffer, William Gray,	*Elkhorn,*	C. E. Sp.
Kurtz, Edward Martineau,	*Milwaukee,*	M. E.
Ochsner, Rudolph John,	*Waumandee,*	E. E.
Rosenstengel, Rudolph,	*Madison,*	E. E.
Sheldon, Sidney Roby,	*Madison,*	E. E.
Silber, Fred David,	*Milwaukee,*	E. E.
Stanchfield, Bartley,	*Fond du Lac,*	M. E.
Tibbits, Heber Lockhart,	*Grand Rapids,*	C. E.
Woodward, William Leonard,	*Madison,*	M. E.
		=19

Junior Class.

Ahara, George Victor,	*Evansville*,	M. E.
Bell, Alfred Carroll,	*Milwaukee*,	C. E. Sp.
Bertrand, Philip Adolphus,	*West Superior*,	E. E.
Bohan, William James,	*Woodman*,	E. E.
Boorse, Jesse Milton,	*Milwaukee*,	E. E.
Brown, Thane Ross,	*Topeka, Kans.*,	C. E.
Bucey, Jonathan Henry,	*Madison*,	C. E.
Burgess, Charles Frederick,	*Oshkosh*,	E. E.
Burgess, George Heckman,	*Oshkosh*,	C. E.
Crenshaw, Thomas Pemberton,	*Richmond, Va.*,	E. E. Sp.
Dillon, Ellis Ellsworth,	*Normal Ill.*,	E. E. Sp.
Falconer, Robert Clemens,	*Madison*,	C. E.
Ford, Arthur Hillyer,	*Madison*,	E. E.
Fowle, Harry Herbert,	*South Milwaukee*,	E. E.
Golder, Lloyd William,	*Rock Falls, Ill.*,	M. E.
Gregerson, Lewis Theodore,	*Stoughton*,	C. E.
Grover, Allison Sanford,	*South Milwukee*,	M. E.
Guilbert, Frank Warburton.	*Racine*,	C. E.
Hanson, Walter Sewell,	*Clinton*,	M. E.
Hartwell, Frank Isham,	*Elkhorn*,	M. E.
Kroncke, Louis William,	*Madison*,	E. E. Sp.
Kümmel, Carl Henry,	*Milwaukee*,	C. E. Sp.
Lee, John Henry,	*Sterling, Ill.*,	M. E.
Maldaner, Arthur,	*Watertown*,	C. E.
Marcher, William Ernest,	*Racine*,	C. E.
McCulloch, Alfred Langdon,	*Janesville*,	C. E.
Mead, George Alvin,	*Racine*,	E. E.
Meyer, Edward William,	*Milwaukee*,	M. E.
Monahan, John Joseph,	*East Troy*,	C. E.
Rendtorff, Edmund Joseph,	*Sauk City*,	E. E.
Richards, Jere Turner,	*Viola*,	C. E.
Rohn, Oscar,	*Jackson*,	C. E.
Rubin, William Benjamin,	*Milwaukee*,	C. E.
Schumann, Theodore Paul M.,	*Prairie du Chien*,	E. E.
Trautman, George Henry,	*Whitewater*,	M. E.
Warner, Martyn Finch,	*Milwaukee*,	E. E.
Wittenburg, Theodore Fred,	*Cedarburg*,	C. E

=37

Sophomore Class.

Bacon, William Thomas,	*Baraboo*,	M. E.
Barnes, Joseph Porter,	*Rockford, Ill.*,	M. E.
Bebb, Edward Crosby,	*Rockford, Ill.*,	C. E.
Birkholz, Julius William,	*Milwaukee*,	E. E.
Burkholder, Charles Irvine,	*Sterling, Ill.*,	E. E.
Carlson, Charles John,	*Janesville*,	M. E.
Conlee, Frederick Monroe,	*Oshkosh*,	E. E.
Daggett, Asbury Dyson,	*Madison*,	C. E. Sp.
Dickey, Glen Deane,	*Racine*,	E. E.
Ela, Edwin Stanton,	*Rochester*,	C. E.
Gayton, D. Alanson Clinton,	*Mount Union, Pa.*,	C. E. Sp.
Goddard, Arthur Lawrence,	*Beloit*,	M. E.
Goette, Louis Adolph,	*Milwaukee*,	E. E.
Hager, Albert Ralph,	*Sterling, Ill.*,	E. E.
Harding, Frank Fuller,	*Hudson*,	E. E.
Hargrave, Russell William,	*Orlando, Fla.*,	M. E.
Hart, Charles Walter,	*Charles City, Ia.*,	M. E.
Hayden, Charles Beecham,	*Sun Prairie*,	E. E.
Johnson, Arthur D.,	*North Greenfield*,	E. E.
Kennedy, William Montgomery,	*Highland*,	C. E.
Lemon, Luther Erwin,	*East Plato, Ill.*,	E. E.
Lloyd, Conrad C.,	*Milwaukee*,	E. E.
Maynard, Joseph Duryea,	*Milwaukee*,	E. E.
McWilliams, Thomas Hazelhurst,	*Boscobel*,	E. E.
Michaels, William,	*Berlin*,	E. E.
Niederman, Henry John,	*Milwaukee*,	M. E.
Palmer, Allen Harry,	*Escanaba, Mich.*,	E. E.
Parr, Charles Henry,	*Wyoming*,	M. E.
Perkins, Jay Hugh,	*Madison*,	E. E.
Powrie, William Robert,	*Waukesha*,	M. E. Sp.
Ramien, Charles Henry,	*Milwaukee*,	M. E.
Reedal, Peter Eugene,	*Dekorra*,	E. E.
Riddle, John Elmo,	*Lodi*,	E. E.
Robinson, George Porter,	*Milwaukee*,	E. E.
Ross, Harry Harson,	*Columbus*,	E. E.
Ruka, Fred William,	*Boscobel*,	E. E.
Scott, Henry Holton,	*Ashland*,	E. E.
Solon, James,	*Richwood*,	E. E. Sp.
Strothman, Herbert Lawrence,	*West Superior*,	E. E.
Trippe, Henry Montague,	*Whitewater*,	C. E.

Van Ness, Leonard George,	*Lodi*,	E. E.
Warner, Fred Dauchy,	*Canaan, N. Y.*,	M. E.
Wilder, George Walker,	*Cooksville*,	E. E.
Williams, Charles Henry,	*Baraboo*,	M. E.
Zimmerman, Oliver Brunner,	*Milwaukee*,	M. E.
Zweifel, John Thomas,	*Calumetville*,	M. E.
		= 46

Freshman Class.

Ahara, Theodore Henry,	*Evansville*,	M. E.
Alexander, Walter,	*Milwaukee*,	M. E. Sp.
Allen, John Samuel,	*Genoa Junction*,	E. E.
Anderson, Christopher Herman,	*Forward*,	E. E.
Armstrong, Alexander G.,	*Madison*,	M. E. Sp.
Beebe, Murray Charles,	*Racine*,	E. E.
Bickley, George Elvin,	*Waterloo, Ia.*,	E. E.
Boynton, Clement Leroy,	*Evansville*,	M. E.
Broenniman, Arnold Emil,	*Watertown*,	C. E.
Brown, Perry Fisher,	*Janesville*,	C. E. Sp.
Buckmaster, James Arthur,	*Fayette*,	E. E.
Carr, John Edwin,	*Beloit*,	E. E. Sp.
Clausen, Leon Raymond,	*Fox Lake*,	E. E.
Cochrane, Robert Boyd,	*Antrim, N. H.*,	M. E. Sp.
Comstock, Eltinge Houghtaling,	*Milwaukee*,	E. E.
Comstock, Nathan,	*Madison*,	M. E.
Coombs, Edward Christopher,	*Madison*,	C. E. Sp.
Cornish, Ross Carlton,	*Oshkosh*,	C. E.
Dixon, Fred,	*New London*,	C. E.
Dutcher, John Edwin,	*Madison*,	E. E. Sp.
Fowle, Arthur Neves,	*South Milwaukee*,	E. E.
Fowle, Irving Horace,	*South Milwaukee*,	M. E.
French, Edwin Frank,	*Neillsville*,	M. E.
Froding, Charles Louis,	*Oconomowoc*,	M. E.
Fuldner, Henry Christian,	*Milwaukee*,	C. E.
Goodyear, Alva Stewart,	*Tomah*,	C. E.
Green, Verne,	*Madison*,	E. E.
Harloff, Paul Frederic,	*Madison*,	M. E. Sp.
Hawley, George Prince,	*Madison*,	C. E. Sp.
Hayes, Harry Spoor,	*Milwaukee*,	E. E.
Hillesheim, Adolph John,	*Dwight, Ill.*,	C. E.
Hoag, Martin Grover,	*Waukesha*,	C. E.

Howe, Adolph Gustenus,	*Stoughton*,	C. E. Sp.
Howe, Leonard Burton,	*Madison*,	M. E.
Jacobsen, Jacob C.,	*Madison*,	E. E. Sp.
James, Benjamin Winfield,	*Rhinelander*,	M. E.
Jeffrey, Joseph A.,	*Platteville*,	E. E. Sp.
Kennedy, Sidney Lawrence,	*New Lisbon*,	C. E. Sp.
Keyser, Charles Frederick,	*Baraboo*,	C. E.
Kiehl, Wallace Philip,	*Oconomowoc*,	E. E.
Kratsch, William Hermann,	*Milwaukee*,	M. E. Sp.
Kurtz, Charles Means,	*Milwaukee*,	C. E.
Lachmund, Herman,	*Sauk City*,	M. E.
Lademan, Otto T.,	*Milwaukee*,	E. E.
Lueth, Emil Samuel,	*Baraboo*,	M. E.
MacKay, Charles Walter,	*Wilton, N. H.*,	M. E. Sp.
Major, Joseph, Jr.,	*Eureka, Ill.*,	M. E.
McConnell, Carl Philip,	*West Salem*,	E. E. Sp.
McDonald, Clinton,	*Waupun*,	C. E.
McGregor, Wallace Francis,	*Janesville*,	E. E.
Mihills, Earl,	*Evansville*,	E. E. Sp.
Nelson, Fred William,	*Fond du Lac*,	M. E.
Nelson, Oscar Martin,	*Boscobel*,	M. E.
Olson, August Edward,	*Cambridge*,	E. E.
O'Neill, Charles,	*Madison*,	C. E. Sp
Owen, Llewellyn,	*Milwaukee*,	E. E.
Patchin, Melvin Taggart,	*New London*,	M. E. Sp.
Petley, Benjamin Henry,	*Milwaukee*,	E. E.
Phillips, John Henry,	*Sun Prairie*,	C. E. Sp.
Reilly, Harry Winne,	*Milwaukee*,	E. E.
Rider, Charles Bangs,	*Racine*,	E. E.
Ross, Harry Beach,	*Beloit*,	E. E. Sp.
Rowell, Lewis D.,	*Madison*,	M. E.
Ruger, William, Jr.,	*Janesville*,	E. E.
Rumsey, Spencer Smith,	*Berlin*,	C. E.
Schaub, Arthur,	*Basel, Switzerland*,	E. E. Sp.
Schildhauer, Edward,	*New Holstein*,	E. E. Sp.
Schmidt, Charles John,	*Milwaukee*,	E. E.
Schriber, Carl Edward,	*Oshkosh*,	E. E.
Schuchardt, Rudolph Fred,	*Milwaukee*,	E. E.
Short, Frank James,	*Elkhorn*,	E. E.
Smith, James William,	*St. Paul, Minn.*,	C. E.
Snashall, Bert Loyall,	*Evansville*,	M. E.
Sovereign, Charles Leslie,	*Rockford, Ill*,	E. E.

Stephens, Arthur David,	*Madison*,	C. E.
Sullivan, Eugene,	*Madison*,	E. E.
Sutor, Donald MacDonald,	*La Crosse*,	C. E. Sp.
Tallman, George Kemp,	*Janesville*,	E. E.
Tilton, Benjamin Ellsworth,	*Oshkosh*,	C. E.
Voth, William Benjamin,	*Milwaukee*,	E. E.
Walker, George Parrott,	*Madison*,	M. E. Sp.
Walker, Ray D.,	*Lancaster*,	E. E.
Warne, Hilton Beckwith,	*Ft. Atkinson*,	E. E.
Webber, Merton Lamont,	*New London*,	C. E. Sp.
Williams, Glenn Herbert,	*Grand Rapids*,	E. E.
Williams, John Tainsh,	*Milwaukee*,	M. E.
Williams, William Henry,	*Stevens Point*,	E. E. Sp.
Wilson, John Frank,	*Sharon*,	E. E. Sp.
Winger, Oscar,	*Grand Rapids*,	M. E.
Wolff, Henry Charles,	*Evansville*,	M. E.
		=90

COLLEGE OF AGRICULTURE.

Long Course.

Green, Fred Duguid,	*Beloit*,	Freshman Class.
True, Gordon Haines,	*Baraboo*,	Senior Class.
		=2

Short Course.

Second Year.

Baker, Fred Everts,	*Whitehall, Illinois.*	
Balsley, Frederick Maltby,	*Fayetteville.*	
Gilbert, William,	*Madison.*	
Means, Charles Roger,	*Stevens Point.*	
Rector, Martin,	*Fennimore.*	
Safford, Henry,	*Sycamore, Illinois.*	
Tompkins, Robert Frank,	*Madison.*	=7

First Year.

Adams, William Clayton,	*Eleva.*
Albrecht, William Fred John,	*Middleton.*
Anacker, Charles,	*Portage.*
Atwood, Roy Almon,	*Trempealeau.*

Bailey, Oscar Joseph,	*Tacoma, Ohio.*
Barclay, James E.,	*Piedmont, Ohio.*
Beaumont, William,	*Hartland.*
Beebe, Roy Raymond,	*Boardman.*
Bennett, Herman James,	*Belvidere, Illinois.*
Benson, Guy A.,	*Browntown.*
Bingham, Delbert E.,	*Richland Center.*
Bixby, John Elon,	*South Haven, Michigan.*
Bollerud, Martin,	*Hollendale.*
Brandt, Louis,	*Johnsonville.*
Brereton, George Henry,	*Dane.*
Brimmer, Otto,	*White Creek.*
Butler, George Charles,	*Sussex.*
Butzke, August William,	*Beechwood.*
Carr, Joseph Leon,	*Milton Junction.*
Davenport, Elmer Alfred,	*Auroraville.*
Diener, Charles Henry,	*Ellington.*
Edgerton, DeWitt Clinton,	*Fond du Lac.*
Everson, Frank Henry,	*Lake Mills.*
Foster, Clyde Perkins,	*Baldwin.*
Greenland, William,	*Sussex.*
Hamlyn, William Windsor,	*West Bend.*
Hanson, John,	*Sturgeon Bay.*
Heller, Albert John,	*Calumetville.*
Hill, Francis Elmer,	*Dousman.*
Horn, Herbert B.,	*Porter's Mills.*
Hummel, Henry Nelson,	*Polk.*
Isom, Albert,	*Madison.*
Jacobson, Louis Martin,	*Clinton.*
Jewell, William Frederick,	*Dodgeville.*
Maynard, Hazen White,	*Waukesha.*
McKenny, Edward,	*Kansas City, Missouri.*
Mead, Robert,	*New Lisbon.*
Merrill, Nathan Hull,	*Alma Center.*
Montgomery, Frank,	*Wausemon.*
Nelson, Jens Anton,	*Luck.*
Niehaus, Henry,	*Whiting.*
Noyes, Ray Arthur,	*Beaver Dam.*
Pearsall, Merton Thomas,	*Waterloo.*
Pfeiffer, George Ferdinand,	*West Bend.*
Philips, Charles Slauson,	*West Salem.*
Riedeburg, Henry,	*Milwaukee.*

Sayles, Arthur Bishop,	*Waukesha.*	
Schoepke, Frederick John,	*Nicholson.*	
Siedenburg, Henry John,	*Elk Mound.*	
Stevenson, James Wilson,	*Poynette.*	
Stone, Frederick Chester.	*Eureka.*	
Swartz, William Henry,	*Waukesha.*	
Todson, Whitford Earnest,	*Elgin, Illinois.*	
Topping, Charles Marshall,	*Delavan.*	
Trigg, Charles Melvin,	*Downing.*	
Wallihan, Abner Banning,	*Dayton.*	
Washburn, Charles Clinton,	*Excelsior.*	
Whitcomb, Howard Pearl,	*Byron, Minnesota.*	
Williams, John L.,	*Waukesha.*	=59

Dairy Class.

Second Year.

Curtis, Evered Woodard,	*Hanska, Minnesota.*	
Dowd, Bert Ernest,	*Red Cedar.*	
Fulmer, Francis Burton,	*Byrds Creek.*	
Reese, Owen,	*Ixonia.*	=4

First Year.

Aldrich, Charles Frank,	*Lake Mills.*	
Aspenwall, Albert Frederick,	*Deerfield.*	
Back, Jacob,	*Grafton.*	
Berg, Julius.	*Ahnapee.*	
Biddick, Loren Peter,	*Mineral Point.*	
Bishop, Gilbert Curtis,	*Brookville, Kansas.*	
Brown, Wayne Earnest,	*Baraboo.*	
Bush, Frederick Henry,	*Augusta.*	
Cease, Clifford Cassius,	*Fairwater.*	
Christensen, Christian Meadsen,	*Chicago, Illinois.*	
Christianson, David Benjamin,	*Deerfield.*	
Clark, Leslie Welb,	*Galesville.*	
Curry, Charles L.,	*Viola.*	
Dailey, Thomas Herlocker,	*Humeston, Iowa.*	
Davis, Leon Cullen.	*Columbus, Kansas.*	
Dawson, Wesley John,	*LaCrosse.*	
Dowling, Ghobert James,	*Edmund.*	

Faker, William,	*Hika.*
Gassett, Julius Lucius,	*Dayton.*
Gerler, Friederick Ludwig,	*Altenburg, Missouri.*
Gerner, Reinhold,	*Fillmore.*
Gibson, John Orr,	*Misha Mokwa.*
Goll, Gerhard,	*Cream.*
Gosney, Robert Edward,	*Bishop, California.*
Graham, Roy Lewis,	*Barnesville, Ohio.*
Grupe, Lewis George,	*Hika.*
Halverson, Louis Adisson,	*Adsit.*
Hamilton, Claude Francis,	*Augusta.*
Harry, Willis Grant,	*Wooster, Ohio.*
Hauk, Edwin,	*Dale.*
Hegele, Gustav Adolph,	*Portland, Oregon.*
Hemker, William,	*Barre Mills.*
Herter, Fred Louis,	*Brussels, Illinois.*
Hinn, George Jacob,	*Banner.*
Hoare, William Richard,	*Mineral Point.*
Holtz, Harry A.,	*Green Spring, Ohio.*
Icke, Rudolph,	*Ellison.*
Jacoby, Loren Homer,	*Abilene, Kans.*
Jones, Frederick Arthur,	*Brandon.*
Jorgenson, Alfred,	*Pine Grove.*
Karlen, Emil,	*Monroe.*
Keller, John Conrad,	*Stearns.*
Krohn, Charles,	*Ellisville.*
Kronitz, Emil,	*Lebanon.*
Kundert, Fred, Jr.,	*New Glarus.*
Larkins, Herbert Chancy,	*Shreve, Ohio.*
Lindemann, Gustav,	*Osman.*
Laubenheimer, Edward,	*Tustin.*
Lobdell, Boughton,	*Durand.*
Mallman, John,	*St. Nazianz.*
Martin, Henry William,	*Eureka.*
McAdam, James,	*Poplar Grove, Illinois.*
McAdam, William,	*Eureka.*
McDermott, Francis,	*Salona.*
Mills, William Elligood,	*Quincy, California.*
Moldenhauer, Otto August,	*Lebanon.*
Nemitz, Emil Joseph,	*Bolt.*
Noel, Henry Joseph,	*Lincoln.*
Nokes, Albert Joseph,	*Palmyra.*

O'Brian, Charles M.,	*Augusta.*
Paddock, Earl Anson,	*Augusta.*
Parkin, Arthur Wright,	*Pine Island, Minnesota.*
Parks, Michael Andrew,	*Grattau.*
Paulson, Ross,	*Bakerville.*
Peppard, John,	*Osman.*
Pfeiffer, Philip John,	*Grafton.*
Pieper, Henry Frederick,	*Woodland.*
Piper, Bruce Victor,	*Pipersville.*
Richards, Lewis Ellsworth,	*Shullsburg.*
Ross, Curtis Herman,	*Belleville.*
Schafer, Bruno,	*Muscoda.*
Schaller, Edward,	*Klevenville.*
Schreiber, Louis,	*Mosel.*
Schwalbach, Mathias Benjamin,	*Newburgh.*
Schwandt, William August,	*Minnesota Junction.*
Sell, Richard Otto,	*Manchester.*
Semeran, Conrad,	*Butternut.*
Seyfert, Julius,	*Silver Creek.*
Shultz, Adolph Fred,	*Poygan.*
Stoner, Henry Joseph,	*Madison.*
Svoboda, Frank,	*Rosiere.*
Teman, Thomas Henry,	*Blue Mounds.*
Timm, Herman Theodore,	*West Bloomfield.*
Tourtellottee, Fred Solomon,	*Ladoga.*
Tregilgus, Joseph Rowe,	*Mineral Point.*
Vannatta, Elias Aaron,	*Platteville.*
Vipond, John William,	*Shullsburg.*
Voigt, Louis Theodore,	*Lewis Corners.*
Voigt, William August,	*Naugart.*
Wagers, Robert Wellington,	*Deersville, Ohio.*
Wahrenbrock, John Ernst,	*Border, Missouri.*
Wallin, Peter Eric,	*Cambridge, Illinois.*
Warner, Thomas James,	*Elk Creek.*
Weatherhead, Albert George,	*South Lyon, Michigan.*
Whitcher, John Franklin,	*Platteville.*
Williams, Arthur,	*Richland City.*
Williams, Gus,	*Belvidere, Illinois.*
Woolcock, Clarence Archibald,	*Waldwick.*
Zastrow, Albert Fred,	*Edgar.*

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COLLEGE OF LAW.

Senior Class.

Agnew, David William,	*Oconomowoc.*
Atwood, George Thomas,	*Madison.*
Austin, Charles Willis,	*Oak Park, Ill.*
Blake, John Jeremiah,	*Mazomanie.*
Bogue, Alan, Jr.,	*Arlington.*
Browne, Arthur T.,	*Des Moines, Ia.*
Buckmaster, Albert Ellsworth,	*Madison.*
Clohisy, Arthur,	*East Troy.*
Collins, William Francis,	*Stevens Point.*
Cooke, Benjamin Calvin,	*Williamstown, Mass.*
Cowie, Robert Somerville,	*Arcadia.*
Cubela, Joseph Mathias,	*Blue River.*
Culbertson, Clarence Barker,	*Augusta.*
Cunningham, Jeremiah John,	*Monroe.*
Davis, Alexis Proal,	*Menomonie.*
Dierks, Edward Jonathan,	*Bloomer.*
Donovan, John Francis,	*Madison.*
Dreier, Herman George,	*Shawano.*
Ecke, Oscar Henry,	*Madison.*
Ekern, Herman Lewis.	*Whitehall.*
Ela, George,	*Rochester.*
Elsner, Richard,	*Milwaukee.*
Engeset, Andrew,	*Murray Grove.*
Englebracht, Charles Albert,	*Berlin.*
Evans, William Lincoln,	*Milwaukee.*
Frawley, Edward Joseph,	*Eau Claire.*
Gittings, John Thomas,	*Racine.*
Grey, Edward Everett,	*Oconomowoc.*
Haben, Leo,	*Denver, Col.*
Hamilton, Herbert Oscar,	*Whitewater.*
Hart, Royal Bryant,	*Madison.*
Hill, Thomas Breckenridge,	*Winona, Minn.*
Johnson, Lars Henry,	*Darlington.*
Jones, Arthur Lincoln,	*Dodgeville.*
Kellogg, Harry LaFayette,	*Madison.*
Kerz, Paul,	*Galena, Ill.*
Kileen, Edward Francis,	*Berlin.*
Lefebvre, Louis Israel,	*Milwaukee.*
Lueck, Martin Lawrence,	*Juneau.*

Lyman, Theron Upson,	*Alden, Iowa.*
Lynch, Patrick Henry,	*Mazomanie.*
Lytle, Jay,	*Madison.*
Macauley, John William,	*Menomonie.*
Matheson, Alexander Everett,	*Elkhorn.*
McBride, Robert James,	*Neillsville.*
McLeod, Arthur William,	*Eagle River.*
McMynn, Robert Norman,	*Madison.*
Minshall, Charles Henry,	*Viroqua.*
Moses, Herbert Leon,	*Lancaster.*
Moss, Marshall Charles,	*Milwaukee.*
Mulberger, Charles,	*Watertown.*
Naylor, William Byron, Jr.,	*Tomah.*
Parkinson, Ben Carroll,	*Madison.*
Parkinson, Henry Gray,	*Madison.*
Patterson, Edgar John,	*Madison.*
Paul, Clarence Arthur,	*Spring Valley, Minn.*
Paul, John Henry,	*Denmark, Iowa.*
Quinlan, William Barclay,	*Pewaukee.*
Rathbone, Henry Riggs,	*Madison.*
Reinsch, Paul Samuel,	*Madison.*
Rosecrantz, Claude,	*Sparta.*
Sames, Albert Morris,	*Rockford, Ill.*
Seaman, Charles,	*Sheboygan.*
Sheridan, Philip,	*Green Bay.*
Silverthorn, Willis Virgil,	*Wausau.*
Simpson, George T.,	*Winona, Minn.*
Smart, Edward Matthew,	*Almond.*
Slama, Charles Havla,	*Kewaunee.*
Spooner, Charles P.,	*Madison.*
Stone, Carlton M,	*Waukon, Ia.*
Ströver, Carl Bernhard,	*Madison.*
Sturtevant, Claude Rufus,	*Neillsville.*
Swett, Herbert Elbridge,	*Waupun.*
Turner, James Huntington,	*Madison.*
Wadleigh, William Samuel,	*Markesan.*
Waller, George William,	*Rochester.*
Walther, Paul William,	*New York, N. Y.*
Whelan, Charles E.,	*Madison.*
Williams, Charles McGee,	*Madison.*
Williams, Leo Augustus,	*Madison.*
Winne, Douglas, Thompson,	*Appleton.*
Wright, Robert John,	*Milwaukee.*

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Junior Class.

Aarons, Charles Lehman,	*Milwaukee.*
Arnold, Norville Blanchford,	*West Superior.*
Benfey, Theodore,	*Sheboygan.*
Bolzendahl, Ferdinand William,	*Milwaukee.*
Bostwick, Samuel Albert,	*Eau Claire.*
Buckheit, Gustave,	*Watertown.*
Bunge, George William,	*Eitzen, Minn.*
Bunn, John Marshall,	*Madison.*
Campbell, Clyde,	*Hudson.*
Case, Charles Chester,	*Prairie du Chien.*
Christianson, Robert,	*Ettrick.*
Clark, Harvey,	*Madison.*
Cleveland, Chester Dwight,	*Oshkosh.*
Coffman, Bert,	*Waukau.*
Constance, Lewis Llewellyn,	*Waupaca.*
Conway, Dennis,	*Grand Rapids.*
Conway, Edward Aloysius,	*Milwaukee.*
Cook, Dayton Eugene,	*Bath, S. D.*
Courtney, George Peter,	*Brooklyn, N. Y.*
Dicke, Fred William,	*Two Rivers.*
Dickinson, Henry Fellows,	*Rockford, Ill.*
Dieckhoff, Emil Chester,	*New Richland, Minn.*
Dillon, Michael Edward,	*Hammond.*
Elliot, George Theodore,	*Milwaukee.*
Elward, Rodney Abbott,	*Peoria, Ill.*
Emmons, William Marion,	*Waupaca.*
Feeney, Fred Jerome,	*Madison.*
Field, Samuel, M.,	*Racine.*
Fontaine, Arthur Benjamin,	*Green Bay.*
Fordyce, Mrs. Elizabeth Helen,	*Phillips.*
Foster, Fred Albert,	*Port Washington.*
Freeman, Henry Warren,	*Chicago, Ill.*
Fugina, Martin Louis,	*Fountain City.*
Gray, William Emmett,	*Commonwealth.*
Green, John Sherman,	*Milwaukee.*
Hamilton, Richard Frank,	*Plainfield.*
Hammond, Ansel Vickery,	*Durand.*
Hartwell, William Gersham,	*Germania.*
Haskell, Herbert Michael,	*Fort Atkinson.*
Hebberd, Charles,	*La Crosse.*

Heim, F. E. Carl,	*Milwaukee.*
Hilbert, Charles Emil,	*Milwaukee.*
Hodges, Gilbert Tennet, Jr.,	*Monroe.*
Hopkins, Nelson Sanford,	*Milwaukee.*
Jordan, Arthur Gray,	*Fairfield, Iowa.*
Karel, John Colonel,	*Kewaunee.*
Katz, George Henry,	*Milwaukee.*
Krez, Albert Conrad,	*Milwaukee.*
Kroencke, George,	*Wilmot.*
Lees, Andrew,	*Alma.*
Mahoney, Daniel Oliver,	*Viroqua.*
McClure, Charles Floyd,	*Sparta.*
Myers, Louis Wescott,	*Lake Mills.*
Nohl, Max William,	*Milwaukee.*
Nugent, Charles H.,	*Jacksonport.*
Oleson, Herman Eric,	*Wisner, Neb.*
Oleson, Oliver,	*Wisner, Neb.*
Orvis, Justin K.,	*Salem.*
Paine, Byron Dixon,	*Madison.*
Pellage, George William,	*Madison.*
Pitkin, Pearly,	*Milwaukee.*
Reed, Frank D.,	*Madison.*
Richards, Nathaniel D.,	*Fort Atkinson.*
Richmond, Benjamin Franklin,	*Arcadia.*
Riley, Charles Gilbert,	*Madison.*
Rogers, Alfred Thomas,	*Plankinton, S. Dak.*
Russell, John Cantwell,	*Thompson.*
Sedgwick, Alexander Kirkwood,	*Ishpeming, Mich.*
Sheldon, Henry Tillinghast,	*Madison.*
Shimunok, George Thomas,	*Milwaukee.*
Simon, Solomon Russell,	*Milwaukee.*
Stevens, Edmund Ray,	*Janesville.*
Swenson, William S.,	*Menomonie.*
Sullivan, Charles,	*Madison.*
Thomas, David Darius,	*Barneveld.*
Tierney, Michael,	*Waunakee.*
Waite, Henry Cole,	*Waukesha.*
Walker, Mortimer Eugene,	*Racine.*
Walker, Samuel Thomas,	*Fond du Lac,*
Walsh, John,	*Two Rivers.*
Ward, Ernest Farwell,	*Black Earth.*
Wartner, Aloys,	*Okee.*

Watrous, William George,	*Madison.*
Wheelihan, Frank Antes,	*Necedah.*
Williams, George Edgar,	*Columbus.*
Woolsey, Theodore D.,	*Polo, Ill.*
Wynne, Frank Bennett,	*Meriah, N. Y.*

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SCHOOL OF PHARMACY

Four Years' Course.

Barth, George Peter,	*Milwaukee.*	Sophomore.
Ludwig, Edwin Robert,	*Milwaukee,*	Sophomore.
Michaels, William,	*Berlin,*	Special Student.
Roberts, Frederick Charles,	*Dodgeville,*	Special Student.

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Two Years' Course.

Senior Class.

Braaten, Martin Olans,	*Utica.*
Dietz, Hugo,	*Mayville.*
Dimock, Harry Amasa,	*Avoca.*
Emmerich, Herman Ludwig,	*Milwaukee.*
Helbing, Charles William,	*Beaver Dam.*
Hunkel, Carl George,	*Milwaukee.*
Jackson, Charles Wilbur,	*Plymouth.*
Jones, Laura Miriam,	*Sun Prairie.*
Mayer, Edward Anton,	*Kaukauna.*
Richtmann, William Oscar,	*Arcadia.*
Silber, Arthur,	*Milwaukee.*
Sumner, Louis Dunning,	*Madison.*
Trayser, Martin Clair,	*New London.*
Vivian, Alfred,	*Mineral Point.*
Williams, Robert Thomas,	*Racine.*

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Junior Class.

Allen, Fred,	*Genoa Junction.*
Allen, Louis Henry,	*Genoa Junction.*
Baetz, John A.,	*Huelsburg.*
Bilstad, Gunerius,	*Cambridge.*
Bossingham, Arthur,	*Oregon.*
Brennan, John Jerome,	*Cato.*
Coerper, Eugene Emil,	*Milwaukee.*
Congdon, Frank Woodruff,	*La Crosse.*
Doherty, Fred,	*Berlin.*
Elwell, Youlen,	*West Salem.*
Haswell, Edwin Lewis,	*Windsor.*
Hoessor, William A.,	*Durand.*
Horn, George W.,	*Mineral Point.*
Lesselyoung, George Phillip,	*Fond du Lac.*
Miles, Alvah Harry,	*West Salem.*
Nash, Frank Lester,	*Hudson.*
Nordvi, Alfred C.,	*Waupaca.*
Palmer, Fred Everett,	*Sparta.*

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Sophomore Class.

James, Martha Morris,	*Oshkosh.*
Kusel, Edward,	*Watertown.*
Schempf, John William,	*Watertown.*
Towne, Metta E.,	*Edgerton.*

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SUMMARY OF STUDENTS.

GRADUATES — 92

Fellows	10
Resident Graduates	43
Graduates studying *in absentia*	39

COLLEGE OF LETTERS AND SCIENCE — 702.

Fellows and Graduates	80
Senior Class — 118	
Ancient Classical Course	11
Modern Classical Course	28
English Course	21
Civic-Historical Course	26
General Science Course	27
Special Students: A. C., 1; Eng., 2; G. S., 2.	5
Junior Class — 134	
Ancient Classical Course	12
Modern Classical Course	23
English Course	12
Civic-Historical Course	23
General Science Course	31
Special Students: A. C., 2; M. C., 12; Eng., 11; C. H., 4; G. S., 4	33
Sophomore Class — 135	
Ancient Classical Course	11
Modern Classical Course	19
English Course	12
Civic-Historical Course	24
General Science Course	15
Special Students: A. C., 1; M. C., 15; Eng., 15; C. H., 10; G. S., 13	54

COLLEGE OF LETTERS AND SCIENCE — continued.

Freshman Class — 206

Ancient Classical Course	9
Modern Classical Course	29
English Course	30
Civic-Historical Course	50
General Science Course	19
Special Students: A. C., 8; M. C., 15; Eng, 15; C. H., 16; G. S., 15	69
Adult Special Students	29

COLLEGE OF MECHANICS AND ENGINEERING — 201

Fellows and Graduates	9

Senior Class — 19

Civil Engineering Course	7
Mechanical Engineering Course	3
Electrical Engineering Course	7
Special Students, C. E. 2	2

Junior Class — 37

Civil Engineering Course	14
Mechanical Engineering Course	8
Electrical Engineering Course	10
Special Student, C. E., 2; E. E., 3	5

Sophomore Class — 46

Civil Engineering Course	4
Mechanical Engineering Course	13
Electrical Engineering Course	25
Special Students, C. E., 2; M. E., 1; E. E., 1	4

Freshman Class — 90

Civil Engineering Course	14
Mechanical Engineering Course	18
Electrical Engineering Course	30
Special Students, C. E., 9; M. E., 8; E. E., 11	28

COLLEGE OF AGRICULTURE — 173

Graduates		2
Long Course		2
Short Course	Second Year	7
	First Year	59
Dairy Course	Second Year	4
	First Year	99

College of Law — 169

Senior Class		82
Junior Class		87

School of Pharmacy — 42

Fellows		1
Four Years' Course		4
Two Years' Course	Senior Class	15
	Junior Class	18
	Sophomore class	4
Total Number of Students		1287
Twice enumerated 8, leaving as actual number		1279

COLLEGE OF LETTERS AND SCIENCE.

Time-table of Elective Studies that Begin in the Fall Term.

	M	T	W	T	F	S
Dr. Austin:						
Physics 7	..	9	..	9	..	..
Miss Ballard:						
Gymnastics	5	..	..	..	5	..
Prof. Barnes:						
Biology 1	3	..	3	..	..	..
Biology 1	..	3	..	3	..	..
Prof. Birge:						
Biology 1	3	..	3	..	..	..
Biology 1	..	3	..	3	..	..
Physiology 4	8	..	8	..	8	..
Mr. Cheney:						
Morphology of Plants.	9	9	9	9	9	..
Prof. Coffin:						
English History 2	9	..	9	..	9	..
English History 2	10	..	10	..	10	..
Hist., 19th Century 6	11	..	11	..	11	..
Prof. Comstock:						
Astronomy 1	12	12	12	12	12	..
Prof. Daniells:						
Chemistry 1	2	2	2	2	2	..
Prof. Davies:						
Theory of Sound 8	2	..	2	..	2	..
Prof. Ely:						
Public Finance 12	4	4	4	..	..	..
Prof. Frankenburger:						
Philos. of Rhetoric 4	12	..	12	..	12	..
Dramatic Reading 6	..	12	..	12	..	..
Prof. Freeman:						
Hist. of the Drama 12.	..	10	..	10	..	..
English Novel 16	9	..	9	..	9	..
Mr. Giese:						
French 3	9	9	..	9	9	..
French 3	..	10	10	..	10	10
French 3	..	11	11	..	11	11
Prof. Haskins:						
Anc. History 1	..	9	..	9	..	..
Anc. History 1	..	10	..	10	..	..
Hist of Middle Ages 3.	11	..	11	..	..	..
English Const. Hist. 8.	..	12	..	..	12	..
Hist of Institutions 9	..	11	..	11	..	..
Prof. Hendrickson:						
Latin 6	10	..	10	..	10	..
Latin 8	..	12	..	12	..	..
Prof. Hobbs:						
Mineralogy 1	11	11	11	11	11	..
Mineralogy 2	10	10	10	10	10	..
Petrology 1	2	2	2	2	2	..
Prof. Hubbard:						
Anglo Saxon 1.	9	..	9	..	9	..
Anglo Saxon Poetry 2.	..	8	8	..	8	..
Hist. of Eng. Lang. 4.	10	10	..	10	10	..
Prof. Jastrow:						
General Psychology 1.	8	8	8	8	8	..
General Psychology 1	9	9	9	9	9	..
General Psychology 1.	2	2	2	2	2	..
Comp. Psychology 4	10	..	10	..	10	..
Prof. Kerr:						
Elementary Greek 1	12	..	12	..	12	..
Greek 7	11	..	11	..	11	..
Dr. Miller:						
Histology 6	..	..	8	..	8	..

	M	T	W	T	F	S
Prof. Olson:						
Beginning Norse 1	12	12	..	12	12	..
Norse 2	11	11	11	11	11	..
Norse 3	10	..	10	..	10	..
Icelandic 4	..	10	..	10	..	..
Prof. Owen:						
Advanced French 4	8	8	8	8	8	..
Italian 1	..	..	..	..	..	..
Prof. Parker:						
Musical Theory 1	..	5	..	5	..	..
Elementary Harmony 2	.	4	..	4	..	..
Advanced Harmony 3	..	10	..	10	..	10
Prof. Parkinson:						
Elementary Law 1	..	10	..	10	..	..
Eng. Const. Law 2	..	9	..	9	..	..
Am. Const. Law 4	9	..	9	..	9	..
Roman Law 6	10	..	10	..	10	..
Mr. Pyre:						
Survey of Eng. Lit. 5	9	..	9	..	9	..
Survey of Eng. Lit. 5	11	..	11	..	11	..
Prof. Rosenstengel:						
German 5	9	..	9	..	9	..
German 6	11	..	11	..	11	..
German Convention 20.	11	..	..	11	12	..
Mr. Saunderson:						
Elocution 8	12	..	12	..	12	..
Prof. Scott:						
Principles of Pol. Econ.	8	8	8	..	..	..
Principles of Pol. Econ.	9	9	9	..	..	..
Economics 9	..	..	12	12	..	..
Economics 10	12	12	..	..	..	..
Prof. Slichter:						
Analytic Mechanics 17.	11		11	..	11	..
Potential Function 18	..	4	..	4	..	..
Hydrodynamics 20	..	11	..	11	..	..
Prof. Snow:						
General Physics 1	..	12	..	12	..	..
General Physics 1	12	..	12	..	..	..
Mr. Sober:						
Latin 4	9	..	9	..	9	..
Prof. Stearns:						
Pedagogy 1	10	10	10	10	10	..
School Supervision 2	..	..	..	8	8	..
Miss Sterling:						
German 10	..	12	..	12	..	12
German 10	12	..	12	..	12	..
Prof. Turner:						
American History 4	..	11	..	11	..	..
Econ. & Soc. U. S. His. 7	12	.	12	12	..	..
Con & Pol. U. S. His. 11	2	..	2	2	..	..
Prof. Van Cleef:						
Greek 2	..	12	..	12	..	12
Greek 9	..	11	..	11	..	..
Prof. Van Hise:						
General Geology 1	12	12	12	12	12	..
Prof. Van Velzer:						
Differential Eq's. 7, 8	10	..	10	..	10	..
Anal. Geometry 12, 14	9	9	9	9	9	..
Mod. Algebra 10	..	10	..	10	..	..
Theory of Numbers	..	11	..	11	..	..
Prof. Wilkins:						
Old German 14	..	..	..	11	12	11
Seminary 15	3	9	..	9	..	..

Time-Table of Elective Studies that Begin in Winter Term.

	M	T	W	T	F	S
Prof. Clements:						
Historical Geology 2...	12	12	12	12	12	..
	4	4	4	4	4	..
Paleontology 3.....	8	8	8	8	8	..
	4	4	4	4	4	..
Prof. Ely:						
American Taxation..13	4	4	4	..	..	..
Prof. Freeman:						
Shakespeare 13.....	9	9	9	9	..	..
Eng. Lyric Poetry 15	10	10	10	10	..	..
Prof. Hubbard:						
Adv. Anglo Saxon 3...	8	..	8	..	8	..
Victorean Era 10.	10	10	..	10	10	..
Prof. Jastrow:						
Experimental Psych 2	9	..	9	..	9	..
Abnormal Psychology 5	..	4	4	4	..	..
Elementary Logic 16...	2	2	2	2	2	..

	M	T	W	T	F	S
Prof. Parkinson:						
Am. Const. Law 3.....	..	9	..	9	..	..
International Law 7.....	10	..	10	..	10	..
Dr. Sharp:						
German Philosophy 11 ..	..	..	..	..	..	..
Ethics 13.....	12	12	12	12	12	..
Prof. Scott:						
Pract. Econ. Questions 4	8	8	8	..	..	..
Pract. Econ. Questions..	9	9	9	..	..	..
Classical Economists 2..	9	9	9	..	..	..
Prof. Stearns:						
Hist. of Philosophy 7 (a)	9	..	9	..	9	.
Hist. of Philosophy (b)..	..	9	..	9	..	..
Æsthetics 15.....	11	11	11	11	11	
Philos. of Education 3...	10	..	10	..	10	..
Pedagogy 5.....	.	10	..	10	..	..

Time-Table of Elective Studies that Begin in Spring Term.

	M	T	W	T	F	S
Prof. Ely:						
Social Ethics 15	4	4	4	..	..	..
Prof. Freeman:						
American Mast'p'ces 20	11	11	11	11	..	..
Prof. Hubbard:						
Chaucer 6	10	10	..	10	10	..
Prof. Jastrow:						
Anthro. Psych. 6	..	10	..	10	.	..
Adv. Logic 17.....	.	9	..	9	..	..
Prof. Parker:						
Counterpoint	..	10	..	10	..	10
Prof. Parkinson:						
Comp. Const. Law 5...	9	..	9	..	9	..

	M	T	W	T	F	S
Prof. Scott:						
Financial U. S. Hist. 5...	8	8	8	..	..	..
Money and Banking 3 ...	8	8	8	..	..	..
Money and Banking.....	9	9	9	..	.	..
Monetary Problems 11...	12	12	..	..	..	..
Prof. Snow:						
Photography 9.....	..	2	..	2	..	..
Prof. Stearns:						
Methods and Manag't 6 .	10	..	10	..	10	..
Pedagogical Seminary 5.	..	10	..	10	..	..
Prof. Van Hise:						
Applied Geology.....	12	12	12	12	12	..

NOTE.—The hours of many electives are fixed only after consultation with classes. The figures following the subjects are the numbers of the sub-courses.

COLLEGE OF LETTERS AND SCIENCE.

Time-table of Required Studies of Freshman Year for 1894-95.

The figures following the subjects refer to the number of the sub-courses. See pp. 64-104.

Hour.	Course	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8 A. M..	M. C..		*Hygiene.		*Hygiene.		
9 A. M..	A. C..	Mathematics, 1, 2, 3	Anc. History, 1.	Mathematics, 1, 2, 3	Anc. History, 1.	Mathematics, 1, 2, 3	Mathematics, 1, 2, 3
	C. H..	Mathematics, 1, 2, 3	Rhetoric, 2.	Mathematics, 1, 2, 3	Rhetoric, 2.	Mathematics, 1, 2, 3	Mathematics, 1, 2, 3
	Eng...	English History, 2	Anc. History, 1.	English History, 2.	Anc. History, 1.	English History, 2.	
	G. S...	Mathematics, 1, 2, 3	Mathematics, 1,2,3	*Hygiene.	Mathematics, 1,2,3	Mathematics, 1, 2, 3	*Hygiene.
10 A. M.	A. C..	Greek, 5, 6.	Greek, 5, 6.	Rhetoric, 2.	Greek, 5, 6.	Greek, 5, 6.	Rhetoric, 2.
	M. C..	Latin, 2.	Latin, 2.	Anc. Histo y, 1.	Latin, 2.	Anc. History, 1.	Latin, 2.
	C. H..	English History, 2.	Anc. History, 1.	English History, 2.	Anc. History, 1.	English History, 2.	
	Eng...	German, 1, 2.	Rhetoric, 2.	German, 1, 2.	German, 1, 2.	Rhetoric, 2.	German, 1, 2.
	G. S...	German, 9.	Rhetoric, 2.	German, 9.	German, 9.	Rhetoric, 2.	German, 9.
11 A. M.	A. C..	Latin, 2.	Latin, 2.	*Hygiene.	Latin, 2.	Latin, 2.	*Hygiene.
	M. C..	Mathematics, 1, 2, 3	Mathematics, 1,2,3	Rhetoric, 2.	Mathematics, 1,2,3	Rhetoric, 2.	Mathematics, 1, 2, 3
	C. H	†Hygiene.	¶German, 1, 2.	¶German, 1, 2.	†Hygiene.	¶German, 1, 2.	¶German, 1, 2.
		¶Latin, 2.	¶Latin, 2.	*Hygiene.	¶Latin, 2.	¶Latin, 2.	*Hygiene.
	Eng. .	Mathematics, 1, 2, 3	†Hygiene.	Mathematics, 1, 2, 3	Mathematics, 1,2,3	†Hygiene.	Mathematics, 1, 2, 3
12 M....	M. C..	German, 3.	German, 3.	German, 3.	German, 3.		
3 P. M .	G. S..	Biology, 1.	Biology, 1.	Biology, 1.	Biology, 1.	Biology, 1.	

Time-table of Required Studies of Sophomore Year for 1894-95.

Hour.	Course	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8 A. M..	Eng ..	German, 2, 11.	German, 2, 11.			German, 2, 11.	German, 2, 11.
9 A. M..	A. C..	Ger., 8, or French,2.	Latin, 3.	Ger., 8, or French,2.	Latin, 3.	Ger., 8, or French,2.	Ger., 8, or French,2.
	M. C..	French, 1.	Latin, 3.	French, 1.	Latin, 2.	French, 1.	French, 1.
	C. H..	Rhetoric, 3.	German, 2, 11.	German, 2, 11,	Rhetoric, 3.	German, 2, 11.	German, 2, 11.
	Eng ..	‡§Anglo Saxon, 1. ‡§Norse, 1.	‡§Norse, 1.	§Anglo Saxon, 1. §Norse, 1.		§Anglo Saxon, 1. §Norse.	
	G. S...	French, 3.	French 3.	Rhetoric, 3.	French, 3.	French, 3.	Rhetoric, 3.
10 A. M.	A. C..	Greek. 5, 6.	Greek, 5, 6.	Rhetoric, 3.	Greek, 5, 6.	Greek, 5, 6.	Rhetoric, 3.
	M. C..		German, 4.	Rhetoric, 3.	German, 4.		Rhetoric, 3.
	C. H..		French, 1.	French, 1.		French, 1.	French, 1.
	Eng ..	Rhetoric, 3.	§French, 1.	§French, 1.	Rhetoric, 3.	§French, 1.	§French, 1.
11 A. M.	Eng ..	Eng. Literature, 5.		Eng Literature, 5.		Eng. Literature, 5.	
	G. S...	¶Mathematics, 4, 5.	¶Mathematics, 4, 5.	¶Mathematics, 4, 5.	¶Mathematics, 4, 5.	¶Mathematics, 4, 5.	
12 M....	A. C.		Physics, 1.		Physics, 1.		
	M. C..		Physics, 1.		Physics, 1.		
	C. H..		§Physics, 1.		§Physics, 1.		
	Eng ..		‡Physics, 1.		‡Physics, 1.		
	G. S...	Physics, 2.	‖ German, 10.	Physics, 2.	‖ German, 10.		‖ German, 10.
2 P. M..	C. H..	§Chemistry, 1.	§Chemistry, 1.	§Chemistry, 1.	§Chemistry, 1.	§Chemistry, 1.	
	Eng ..	‡Chemistry, 1.	‡Chemistry, 1.	‡Chemistry, 1.	‡Chemistry, 1.	‡Chemistry, 1.	
	G. S..	¶Chemistry, 1.	¶Chemistry, 1.	¶Chemistry, 1.	¶Chemistry, 1.	¶Chemistry, 1.	
3 P. M..	C. H..	§Biology, 1.	§Biology, 1.	§Biology, 1.	§Biology, 1.	§Biology, 1.	
	Eng ..	‡Biology, 1.	‡Biology, 1.	‡Biology, 1.	‡Biology.	‡Biology, 1.	

* For Fall Term only. † For Winter Term only. ¶ But one of these two subjects need be taken.
‡§ But one of these three subjects need be taken. ‖ Elective.

COLLEGE OF MECHANICS AND ENGINEERING – FALL TERM.

ABBREVIATIONS.—T. E., Topographical Engineering; M. D., Machine Design; R. E. Railway Engineering; E. E. Electrical Engineering; Str. E, Structural Engineering; S. E., Steam Engineering; H. & S. E., Hydraulic and Sanitary Engineering; H. & C., Highways and Canals; d., daily.

Yr.	Course.	8.	9.	10.	11.	12.	P. M. and Sat.
FRESHMAN.	C. E.	T. E. 1, d.	T. E. 1, d.	Math. 1, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.,1a,M.W.F.	Shop 1, W., 2-4; F., 2-5.
	M. E.	Shop 1, M. W.	Shop 1, M., W., F.	Math. 1, d.	Fr. 4, or Ger. 9a, d.	Eng. & R ,1a,M.W.F.	M. D. 1, d. 2-4.
	E. E.	M. D. 1, d.	M. 1, d.	Math. 1, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.,1a,M.W.F.	Shop 1, Th., 2-4; S., 8-11.
SOPHOMORE.	C E.	Math. 4, 5, d.	Mineralogy 2, M., Tu., W., Th.	T. E. 2, Tu., Th. Chem. 1, F.	T. E. 2, Tu., Th. Chem. 1, F.	Phy. 2, M., W., F.	Chem. 1, Tu.,Th , 2; M.,W.,F., 2-4. Phy. 3b, M., 4-6; Th., 3-5.
	M. E.	Math. 4, 5, d.	Shop 4, 5, M., W.	M. D. 2, Tu., Th. Chem. 1, F. Shop 4, 5, M , W.	M. D. 2, Tu., Th. Chem. 1, F. Shop 4, 5, M., W.	Phy. 2, M., W., F.	Chem. 1, Tu ,Th., 2; M., W.,F., 2-4. Shop 4, 5, S. 10-12. Phy. 3b, M., 4-6; Th., 3-5.
	E. E.	Math. 4, 5, d.	Shop 4, 5, Tu ,Th.	M. D. 2, M., W. Chem. 1, F. Shop 4, 5, Tu., Th.	M. D. 2, M., W. Chem. 1, F. Shop 4, 5, Tu., Th.	Phy. 2, M., W., F. Shop 4, 5, Tu., Th.	Chem. 1, Tu., Th., 2; M.,W.,F., 2-4. Shop 4, 5, S., 8-10. Phy. 3a, Tu., 3-5.
JUNIOR.	C. E.	Str. E. 1, Tu.,Th. Mech. 2, M., W.	Str. E. 1, Tu.,Th. Mech. 2, M., W.	R. E. 2, M., W. M. D. 3, Tu., Th., F.	Mech. 1b, d.	Str. E. 2a, Tu., Th.	R. E. 1, W., 2-4; F., 2-6; S., 8-12. Mech. 2, M., 2-6.
	M. E.	Shop 6, F.	Shop 6, F.	M. D. 3, Tu., Th., F. M. D. 4, M., W.	Mech. 1b, d.	E. E. 1, d.	Shop 6, W., F., 2-5. Mech. 2, Tu., Th., 2-6.
	E. E.		Mech. 1b, d.	M. D. 3, Th , F. M. D. 4, M., W.	M. D. 3, Tu.	E. E. 1, d.	Shop 6 & 9, M., 2-4; Tu., Th., 2-5. Phy. 5, W., F., 2-4.
SENIOR.	C. E.	Str. E. 7b, d.	Str. E. 7b, d.	H. & S. E. 1a, F. Mech.1c,M.Tu.W.Th.	Str. E. 5b, 6, d	H. & S. E. 1a, Tu.Th. R. E. 5, M., W., F.	
	M. E.	M. D. 7a, M.,W.,F.	M. D. 7a, M.,W.,F.	S. E. 3, Tu.,W.,Th ,F.	S. E. 3, Tu.,W.,Th ,F.	S. E. 3, M., W., F. M. D. 7a, Tu., Th.	Shop 10, Tu., Th., 2-5. S. E. 4, M., W., 2-4; S , 9-11.
	E. E.	M.D. 7b, M.,W.,F.	M. D. 7b, M.,W.,F.	E. E. 2b, Tu., Th. E. E. 4, M., W., F.	M. D. W., F. – E. E. 6a, M., T., Th.	S. E. 3, M., W., F.	E. E. 4, M., W., 2-4. S. E. 4, Tu., Th., 2-4. E. E. 2b, F., 2-4.

COLLEGE OF MECHANICS AND ENGINEERING—WINTER TERM.

ABBREVIATIONS.—T. E., Topographical Engineering; M. D., Machine Design; R. E., Railway Engineering; E. E., Electrical Engineering; Str. E, Structural Engineering; S. E, Steam Engineering; H. & S. E., Hydraulic and Sanitary Engineering; H. & C., Highways and Canals; d. daily.

Yr.	Course.	8.	9.	10.	11.	12.	P. M. and Sat.
FRESHMEN.	C. E.	Shop 8, M., W.	Shop 8, M., W., F.	Math. 2, 3, d.	Fr. 4, or Ger. 9a, d.	Eng. & R. 1b, M.W.F.	Math. 8, d. 2-4.
	M. E.	Math. 8, d.	Math. 8, d.	Math. 2, 3, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.1b. M.W.F.	Shop 2, W. 2-4; F. 2-5.
	E. E.	Math. 8, d.	Math. 8, d.	Math. 2, 3, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.1b, M.W.F.	Shop 2, Th. 2-4; S. 8-11.
SOPHOMORE.	C. E.		Mech. 1a, d.	Chem. 1, Tu., Th.	Chem. 1, Tu., Th.	Phy. 2, M., W., F.	Math. 5, d. 4-5. Chem. 1, M., W., F. 2-4. Phy. 3b, Tu., Th., 2-4.
	M. E.		Mech. 1a, d.	Chem. 1, Tu., Th. M. D. 2, M., W., F.	Chem. 1, Tu., Th. M. D. 2, M., W., F.	Phy. 2, M., W., F.	Math. 5, d. 4-5. Chem. 1, M., W., F. 2-4. Phy. 3b, Tu., Th., 2-4.
	E. E.	Mech. 1a, d.		Chem. 1, Tu., Th. M. D. 2, W, F.	Chem. 1, Tu., Th. M. D. 2, W. F.	Phy. 2, M., W., F.	Math. 5, d. 4-5. Chem. 1, M., W., F. 2-4. Phy. 3a, one-fifth.
JUNIOR.	C. E.	Str. E. 3, 4, d.	Str. E. 3, 4, d.	T. E. 4, Tu, Th. S. E. 5, M., W., F.	Mech. 3, M., W., F. R. E. 3, Tu., Th.	Mech. 3, d.	Mineralogy 2, M., W. 2-4. Str. E. 2b, Tu., Th. 2-4.
	M. E.	M. D. 5, d.	M. D. 5, d.	M. D. 5, Tu., Th.	S. E. 1, d.	E. E. 1, M.	E. E. 1, Tu., Th. 2-4; S. 9-1. Shop 7, 8, M., W. 2-5; F. 2-6.
	E. E.	M. D. 5, d.	M. D. 5, d.	M. D. 5, Tu., Th. S. E. 5, M., W., F.	Shop 8, W., F. Mech. 2, Tu., Th.	E. E. 1, M. Shop 8, W, F. Mech. 2., Tu., Th.	E. E. 1, Tu., Th. 2-4; S. 9-1. Phy. 6, M., F. 2-5. Mech. 2, W. 2-6.
SENIOR.	C. E.	Str. E. 7c., M., Tu., W., Th.	Str. E. 7c, M Tu. W., Th.	H. & S.E.,1b,M.,W.,F.	Astronomy 6, Tu.,Th R. E. 4, M., W., F.	H. & C, 2, Tu., Th.	H. & S. E. 3b, M., W., 2-4. Laws of corporations and contracts.
	M. E.		S. E. 3, M. W. F. S. E. 4, Tu. Th.	S. E. 4, Tu., Th.	S. E. 4 Tu., Th. M. D. 7a, M., W., F.	M. D. 7a, Tu., Th. M. D. 7a, M., W., F.	Shop 11, M., W., F. 2-4. Laws of corporations and contracts.
	E.E.		E. E. 3, M., W. E. E. 3, Tu., Th.	E. E. 4, M., W., F. E. E. 3 Tu., Th.	M. D. 7b, Tu., Th. M. D. 7b, M., W., F.	E. E. 6b, Tu., Th. M. D. 7b, M., W., F.	E. E. 4, M., W. 2-4. Laws of corporations and contracts.

COLLEGE OF MECHANICS AND ENGINEERING—SPRING TERM.

ABBREVIATIONS.—T. E., Topographical Engineering; M. D., Machine Design; R. E., Railway Engineering; E. E., Electrical Engineering; Str. E., Structural Engineering; S. E., Steam Engineering; H. & S. E., Hydraulic and Sanitary Engineering; H. & C., Highways and Canals; d., daily.

Yr.	Course.	8.	9.	10.	11.	12.	P. M. and Sat.
FRESHMAN.	C. E.	Shop 3, M., W.	Shop 3, M., W., F.	Math. 4, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.1c, M., W., F.	Math. 8, d. 2-4.
	M. E.	Math. 8, d.	Math. 8, d.	Math. 4, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.1c, M., W., F.	Shop 3, W. 2-4; F. 2-5.
	E. E.	Math 8, d.	Math. 8, d.	Math. 4, d.	Fr. 4, or Ger. 9a, d.	Eng. & R.1c, M., W., F.	Shop 3, M. 2-4; S. 8-11.
SOPHOMORE.	C. E.		Mech. 1a, d.	T. E. 3, M., W.	Math. 6, M., W., F.	Phy. 2, M., W., F. Math. 5, Tu., Th.	Phy. 3b, Tu. 2-4. T. E. 3, W. 2-4; F. 2-6; S. 8-12.
	M. E.	Math. 7, M., W., F.	Mech. 1a, d.	M. D. 2, d.	M. D. 2, d.	Phy. 2, M., W., F. Math. 5, Tu., Th.	Phy. 3 b, Th., 2-4. Chem. 1, M., W., 2-4.
	E. E.	Mech. 1a, d.	Math. 7, M., W., F.	M. D. 2, d.	M. D. 2, d.	Phy. 2, M., W., F. Math. 5, Tu., Th.	Phy. 3a, F. 2-4. Chem. 1, M., W., 2-4.
JUNIOR.	C. E.	Str. E. 7a, T., W., Th, F.	S. E. 6, M. Str. E. 7a, Tu., W. Th. F.	Mech. 1c, d.	S. E. 6, W. Str. E. 5a, M., Tu., Th., F.	S. E. 6, W.	Astronomy 5, d. 2-4, S. E. 6, S. 8-10.
	M. E.	S. E. 4, W., F.	S. E. 4, M. S. E. 4, W., F. M. D. 6, Tu., Th.	S. E. 2, d.	M. D. 5, d.	M. D. 5, d.	S. E. 4, Tu. 2-4. Shop 9, M., W., Th., 2-4; F. 2-6.
	E. E.		S. E. 4, M. S. E. 5, W., F. M. D. 6, Tu, Th.	E. E. 2a, M., Tu., W., Th.	M. D. 5, d.	M. D. 5, d.	E. E. 2a, Tu., Th., 2-4. S. E. 4, W., F., 2-5. Shop 7, M. 2-4; S. 8-12.
SENIOR.	C. E.	H. & S. E., 1c., Tu., T. Str. E 8, M.	H. & S. E. 1c, Tu. Th. H. & C., M., W.	Geology 5, d.	R. E. 6, M. Tu., Th., F. Str. E. 8, W.	R. E. 6, M., Tu., Th., F.	
	M. E.	H. & S. E. 3a, d.	H. & S. E. 3a, d.		H. & S. E. 2, M. Tu., Th., F.	Shop 12, Tu., Th.	Shop 12, 2-4, d.
	E. E.	H. & S. E. 3a, d.	H. & S. E. 3a, d.	E. E. 6c, d.	H. & S. E. 2, M., Tu., Th., F.	E. E. 5, d.	

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