CATALOGUE

OF THE

UNIVERSITY OF ILLINOIS

1898-99

URBANA, ILLINOIS
PUBLISHED BY THE UNIVERSITY
1899

Learning and Labor

CATALOGUE

OF THE

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(POSTOFFICE, CHAMPAIGN OR URBANA, ILL.)

1898-99

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CONTENTS

THE UNIVERSITY CALENDAR

1899–1900

FIRST SEMESTER, 1899.

Sept. 14, Thursday.	Entrance examinations begin.
Sept. 18, 19, Monday and Tuesday.	Registration Days.
Sept. 20, Wednesday.	Instruction begins.
Nov. 6, Monday.	Latest date for Announcing Subjects for Theses.
Nov. 30, Thursday.	Thanksgiving Day.
Dec. 23, Saturday.	Holiday Recess begins.
Jan. 8, 1900, Monday.	Instruction resumed.
Feb. 2, Friday.	First Semester ends.

SECOND SEMESTER, 1899-1900

Feb. 5, Monday.	Registration Day.
Feb. 6, Tuesday.	Instruction begins.
Feb. 19, Monday.	Prize Debate.
May 16, 17, 18, Wednesday evening to Friday noon.	University High School Conference and High School Art Exhibit.
May 18, Friday.	Interscholastic Oratorical Contest.
May 19, Saturday.	Interscholastic Athletic Meet.
May 28, Monday.	Hazelton Prize Drill.
May 29, Tuesday.	Competitive Drill.
June 1, Friday.	Latest Day for Acceptance of Theses.
June 10, Sunday.	Baccalaureate Address.
June 11, Monday.	Class Day.

June 12, Tuesday.	Alumni Day and Oratorical Contest.
June 13, Wednesday.	Twenty-ninth Annual Commencement.

FIRST SEMESTER, 1900-1901

Sept. 13, Thursday.	Entrance Examinations begin.
Sept. 17, 18, Monday and Tuesday.	Registration Days.
Sept. 19, Wednesday.	Instruction begins.
Nov. 5, Monday.	Latest date for Announcing Subjects of Theses.
Nov. 29, Thursday.	Thanksgiving Day.
Dec. 22, Saturday,	Holiday Recess begins.
Jan. 7, 1901, Monday.	Instruction resumed.
Feb. 1, Friday.	First Semester ends.

1899

SEPTEMBER

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* U. stands for Urbana; C., for Champaign. † Died Oct. 20, 1898.

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*Died March 9, 1899.

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LECTURERS, DEMONSTRATORS, AND CLINICAL INSTRUCTORS

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CARL BECK, M.D., Instructor in Surgical Pathology.
Reliance Building, Chicago.

A. McDIARMID, M.D., Lecturer on Obstetrics.
Columbus Memorial Building, Chicago.

W. L. BALLINGER, M.D., Lecturer on Rhinology and Laryngology. *Stewart Building, Chicago.*

F. W. E. HENKEL, M.D., Lecturer on Materia Medica.
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THEODORE TIEKEN, Curator of the Laboratories. *College.*

MISS E. M. HEELAN, Clerk. *College.*

J. S. TOMLINSON, Superintendent. *College.*

GRACE H. BRYANT, Librarian. *College.*

SCHOOL OF PHARMACY

FACULTY

FREDERICK MARION GOODMAN, PH.G., DEAN OF THE FACULTY, Professor of Materia Medica and Botany and Director of the Microscopical Laboratory. *465 State Street, Chicago.*

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WILLIAM AUGUST PUCKNER, Ph.G., Professor of Physics and Chemistry and Director of the Chemical Laboratory.
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WILLIAM BAKER DAY, Ph.G., Secretary of the Faculty, Instructor in Materia Medica and Microscopy.
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GEORGE EDWIN CASE, Ph.G., Instructor in Pharmacy.
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EDMUND NORRIS GATHERCOAL, Ph.G., Assistant in Microscopy. *465 State Street, Chicago.*

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PREPARATORY SCHOOL

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LILLIE ADELLE CLENDENIN, Instructor in English.
928 West Green Street, U.

REUBEN S DOUGLASS, A.B., Instructor in Mathematics.
918 West Green Street, U.

CHARLES BREWSTER RANDOLPH, A.B., Instructor in Greek and Latin. *504 West Illinois Street, U.*

CLARENCE WALWORTH ALVORD, A.B., Instructor in History and Mathematics. *608 East Clark Street, C.*

STATE LABORATORY OF NATURAL HISTORY

LABORATORY STAFF

Professor STEPHEN ALFRED FORBES, Ph.D., Director of State Laboratory and State Entomologist.
1209 West Springfield Avenue, U.

FRANK SMITH, A.M., Assistant Zoölogist.
1006 West Illinois Street, U.

CHARLES ARTHUR HART, Systematic Curator of Collections.
917 West Green Street, U.

CHARLES ATWOOD KOFOID, PH.D., Superintendent of Biological Station. *909 California Avenue, U.*
WALLACE CRAIG, B.S., Zoölogical Assistant. *Havana, Illinois.*
MARY JANE SNYDER, Secretary. *806 South Sixth Street, C.*
HENRY CLINTON FORBES, Librarian and Business Agent. *912 West Illinois Street, U.*
LYDIA MOORE HART, Artist. *917 West Green Street, U.*

AGRICULTURAL EXPERIMENT STATION

STATION STAFF

PROFESSOR EUGENE DAVENPORT, M.AGR., Director, Agriculturist. *Experiment Station Farm, U.*
PROFESSOR THOMAS JONATHAN BURRILL, PH.D., Horticulturist and Botanist. *1007 West Green Street, U.*
CYRIL GEORGE HOPKINS, PH.D., Chemist. *907 South Wright Street, C.*
PROFESSOR STEPHEN ALFRED FORBES, PH.D., Consulting Entomologist. *1209 West Springfield Avenue, U.*
PROFESSOR DONALD McINTOSH, V.S., Consulting Veterinarian. *511 West Park Street, C.*
GEORGE PERKINS CLINTON, M.S., Assistant Botanist. *913 California Avenue, U.*
WILBER JOHN FRASER, B.S., Assistant in charge of Dairying. *1003 South Wright Street, C.*
PERRY GREELEY HOLDEN, B.S., Assistant Agriculturist. *903 California Avenue, U.*
JOSEPH CULLEN BLAIR, Assistant Horticulturist. *1411 West Springfield Avenue, U.*

UNIVERSITY OF ILLINOIS

LOCATION

The University of Illinois is situated in Champaign County, in the eastern central part of the state between the cities of Champaign and Urbana, within the corporate limits of the latter. It is one hundred and twenty-eight miles south of Chicago, at the junction of the Illinois Central, the Cleveland, Cincinnati, Chicago and St. Louis, and the Wabash railroads. The country around is a rich and prosperous agricultural region. The cities of Urbana and Champaign have a combined population of about 15,000.

HISTORY

In 1862 the national government donated to each state in the Union public land scrip in quantity equal to 30,000 acres for each senator and representative in congress, "for the endowment, support, and maintenance of at least one college, whose leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts * * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On account of this grant the state pays the University, semi-annually, interest at the rate of five per cent. on about $470,000, and the University owns about 12,000 acres of unimproved land worth, approximately, $140,000.

To secure the location of the University several counties entered into competition by proposing to donate to its use specified sums of money, or their equivalent. Champaign County offered a large brick building in the suburbs of Urbana, erected for a seminary and nearly completed, about 1,000 acres of land, and $100,000 in county bonds. To this the Illinois Central Railroad added $50,000 in freight. The General Assembly accepted this offer May 8, 1867.

The state has from time to time appropriated various sums for permanent improvements, as well as for maintenance. The present value of the entire property and assets is estimated at $1,600,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University, and placed under the control of a Board of Trustees, constituted of the Governor, the Superintendent of Public Instruction and the President of the State Board of Agriculture, as *ex-officio* members, and twenty-eight citizens appointed by the Governor. The chief executive officer, usually called President, was styled Regent, and was made *ex officio* a member of the Board, and presiding officer both of the Board of Trustees and of the Faculty.

In 1873 the Board of Trustees was reorganized, the number of appointed members being reduced to nine and of *ex-officio* members to two—the Governor and the President of the State Board of Agriculture. In 1887 a law was passed making membership elective, at a general state election, and restoring the Superintendent of Public Instruction as an *ex-officio* member. There are, therefore, now three *ex-officio* members and nine by public suffrage. Since 1873 the President of the Board has been chosen by the members from among their own number for a term of one year.

The University was opened to students March 2, 1868, when there were present, beside the Regent, three professors and about fifty students. During the first term another instructor was added, and the number of students increased to 77—all young men.

During the first term instruction was given in algebra, geometry, physics, history, rhetoric, and Latin. Work on the farm and gardens or about the buildings was at first compulsory for all students, but in March of the next year compulsory labor was discontinued, save when it was made to serve as a part of class instruction. A chemical laboratory was fitted up during the autumn of 1868. Botanical laboratory work began the following year. In January, 1870, a mechanical shop was fitted up with tools and machinery, and here was begun the *first shop instruction* given in any American university. During the summer of 1871 the present Wood Shops and Testing Laboratory was erected and equipped for students' shop work in both wood and iron.

By vote, March 9, 1870, the Trustees admitted women as students. During the year 1870-71 twenty-four availed themselves of the privilege. Since that time they have constituted from one-sixth to one-fifth of the total number of students.

By the original state law certificates showing the studies pursued and the attainments in each were given instead of the usual diplomas and degrees. The certificates proved unsatisfactory to the holders, and in 1877 the legislature gave the University authority to confer degrees.

In 1885 the legislature changed the name of the institution to the "University of Illinois."

During the same session of the legislature a bill was passed transferring the *State Laboratory of Natural History* from the Illinois State Normal University to the University of Illinois. This Laboratory was created by law for the purpose of making a natural history survey of the state, the results of which should be published in a series of bulletins and reports, and for the allied purpose of furnishing specimens illustrative of the flora and fauna of the state to the public schools and to the state museum. For these purposes direct appropriations are made by the legislature from session to session. A large amount of material has been collected and extended publications have been made in both the forms above mentioned.

By an act approved March 2, 1887, the national government appropriated $15,000 per annum to each state for the purpose of establishing and maintaining, in connection with the colleges founded upon the congressional act of 1862, agricultural experiment stations, "to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science." Under this provision the *Agricultural Experiment Station* for Illinois was placed under the direction of the Trustees of the University, and a part of the University farm, with buildings, was assigned for its use. At least one bulletin of results is published every three months, and the copies are gratuitously distributed over the state. Editions of 18,000 copies are now issued.

For the more complete endowment of the state institutions founded upon the act of 1862, the congress of the United States by a supplementary law passed in 1890, made further appropriations. Under this enactment each such college or university received the first year $15,000, the second $16,000, and thereafter was to receive $1,000 per annum additional to the amount of the preceding year, until the amount reached $25,000, which sum was to be paid yearly thereafter.

The Chicago College of Pharmacy, founded in 1859, became the *School of Pharmacy of the University of Illinois* May 1, 1896. Its rooms are at 465 State Street, Chicago.

At the meeting of the Board of Trustees of the University held Dec. 8, 1896, upon recommendation of President Draper, the Trustees voted to take steps looking to the organization of a law school. Appropriations were made for salaries, for the purchase of books, and for incidental expenses. Pursuant to this action of the Board of Trustees, the *School of Law* was organized during the following spring and summer, and was opened Sept. 13, 1897. The course as originally planned covered two years, conforming to the existing requirements for admission to the bar in Illinois. The supreme court of the state, however, announced in November following rules covering examinations for admission to the bar which made three years of study necessary, and the course of study in the Law School was immediately rearranged on that basis.

Negotiations looking to the affiliation of the College of Physicians and Surgeons, of Chicago, with the University, which had been going on for several years, were concluded pursuant to action taken by the Board of Trustees upon definite propositions submitted by the College of Physicians and Surgeons to the Board at its meeting of March 9, 1897. According to the agreement made, the College of Physicians and Surgeons became on April 21, 1897, the *School of Medicine of the University of Illinois.* The School is located at 813 W. Harrison Street, Chicago.

At the meeting of the Board of Trustees held April 22, 1897, the matter of the appointment of a librarian was considered by the Board and referred to a committee. This action of the Board was taken with the view of bringing to the University the *School of Library Economy,* which had been established in 1893 at the Armour Institute of Technology, in Chicago, and of securing the Director of that school for librarian of the University library. These plans were carried out and the *State Library School* was opened at the University in September, 1897.

BUILDINGS AND GROUNDS

The land occupied by the University and its several departments embraces about 210 acres.

The Chemical Laboratory is a building 75 by 120 feet, and two stories high, with basement. It contains general laboratories for students, instructors' laboratories, lecture rooms, store rooms, scale rooms, and various apartments for special purposes.

Engineering Hall has a frontage of 200 feet, a depth of 76 feet on the wings and 138 feet in the center. The first story contains the laboratories of the department of physics, the drafting seminary, and one of the recitation rooms of the department of electrical engineering, and the masonry laboratories and instrument rooms of the department of civil engineering. The second story contains the lecture room and the preparation rooms of the department of physics, and the recitation and drawing rooms, cabinets, and studies of the departments of civil and municipal engineering, and the main office of the department of electrical engineering. The third story contains the elementary laboratory of the department of physics, the drawing rooms, lecture rooms, cabinets, and studies of the mechanical departments, as well as the library, the office, and the faculty parlor. The fourth story is devoted to the department of architecture, and contains drawing and lecture rooms, cabinets, a photo studio, and a blue-print laboratory.

The Wood Shops and Testing Laboratory is two stories high, 126 feet in length, and 88 feet in width, and contains the laboratory of applied mechanics, the hydraulic laboratory, and the wood shop on the first floor. The second floor is occupied by the *Men's Gymnasium.*

The Metal Shops is a one-story brick building, 50 by 250 feet. It contains a lecture room, two office rooms, a machine shop, a foundry, and a forge shop. The machine shop is 48 by 140 feet. Power is supplied by a 20 H. P. electric motor. A three-ton traveling crane of 12 foot span covers the center of the floor for the entire length, extending over a covered driveway between the machine shop and foundry.

The Mechanical and Electrical Engineering Laboratory is a pressed brick building, two stories high, 100 feet long and 50 feet wide, with a one-story wing 90 feet long and 50 feet wide. There is also a basement under the main part, containing some special testing rooms, store rooms, and the toilet and wash rooms.

The Central Heating Station is a brick building, 55 by 120 feet. It contains the apparatus used for heating the buildings on the campus. An annex contains the pump room and the stock room. The pipes of the heating system and the wires for power and light, are carried from the Central Heating Station to the several buildings through brick tunnels 6½ feet high by 6 feet wide. The length of tunnel thus far constructed is 1,800 feet.

Military Hall, 100 by 150 feet, in one grand hall, gives ample space for company and battalion maneuvers and for large audiences upon special occasions.

Natural History Hall is 134 by 94 feet, with basement, two main stories, and an attic. It is occupied by the departments of botany, zoölogy, physiology, mineralogy, and geology, for each of which there are laboratories, lecture rooms, and offices; it also contains the office and equipments of the State Laboratory of Natural History, and of the State Entomologist, as well as the office, library, and chemical laboratory of the Agricultural Experiment Station. There are six laboratory rooms on each of the main floors—sufficient altogether to accommodate two hundred students, besides offering abundant facilities for the private work of the instructors.

The Astronomical Observatory is in the form of the letter T, the stem of which extends toward the south. The equatorial room, surmounted by the dome, is at the intersection of the stem and bar of the T. Besides the equatorial room the Observatory contains four transit rooms, a clock room, a recitation room, a study, and dark rooms for photographic purposes.

University Hall occupies three sides of a quadrangle, measuring 214 feet in front and 122 feet upon the wings. It is devoted almost exclusively to class rooms.

The Library Building is 167 by 113 feet, with a tower 132 feet high. The main floor contains the reference room, the reading room, the conversation room, the Library School lecture room, and the delivery room, which opens into the second story of the book-stack. The second floor contains the Library School class room, four seminary rooms, and the administrative offices of the University. The basement contains well lighted rooms, which are at present used for various purposes. The book-stack is a rear wing to the building, separated from the rest of it by a fireproof wall. The stack will eventually contain five stories, and will accommodate 150,000 volumes. At present but three stories are fitted with shelving.

There are, in addition to these buildings, a veterinary hall, four dwellings, three large barns, and a greenhouse.

THE GYMNASIUMS

The Men's Gymnasium is equipped with the latest appliances. There is an unobstructed floor space of 61 by 121 feet, properly lighted, heated, and ventilated. The building contains shower baths, needle bath, tub bath, lavatories, team rooms, lecture room, examination room, director's offices, and locker rooms. The gymnasium is open from 9 a. m. to 6 p. m., and from 7 to 9 p. m. The adjoining Illinois Field, 450 by 700 feet, containing a one-third-mile running and bicycle track, class and University foot-ball fields, and base-ball diamond, serves well for all games, and upon it take place all the intercollegiate contests.

The Women's Gymnasium occupies very attractive quarters in Natural History Hall, and is fully equipped. The pastime grounds near by, in use through the year when the weather permits, have a sixteen-lap running track, eight tennis courts, two basket ball fields, and space for handball, hurdling, and other desirable amusements. Under suitable restrictions, at certain hours, the rooms are open for exercise to those who are not enrolled in the classes.

LABORATORIES

SCIENCE LABORATORIES*

The *botanical, geological, physiological, and zoölogical laboratories* are in Natural History Hall.

The *chemical laboratory* occupies the building of the same name, already described.

*For a more detailed account of these laboratories see under the appropriate College.

The *physical laboratory* is in Engineering Hall. It is provided with piers, a constant temperature room, and other conveniences for measurement work.

The *psychological laboratory,* in Natural History Hall, is well provided with apparatus of many different kinds for use in experimental study, research, and instruction.

ENGINEERING LABORATORIES

The *cement laboratory* of the department of civil engineering occupies rooms in Engineering Hall, and is provided with slate tables, testing machines, molding machines, sieves, etc., and sample barrels of hydraulic cement, varieties of sand, and other necessary materials.

The *electrical engineering laboratory* occupies space on three floors of the Mechanical and Electrical Engineering Laboratory.

The *mechanical engineering laboratory* occupies the rear wing of the Mechanical and Electrical Engineering Laboratory.

The *laboratory of applied mechanics* is located in the Wood Shops and Testing Laboratory.

SPECIAL LABORATORIES FOR RESEARCH

The *laboratory of the Agricultural Experiment Station* occupies a part of the basement of Natural History Hall.

The laboratory rooms of the *State Laboratory of Natural History* are in Natural History Hall.

A *Biological Experiment Station* has been established by the University on the Illinois River at Havana, Illinois, and equipped for field and experimental work in aquatic biology. It has its separate staff, but is open to students of the University at all times, on application, and to special students not otherwise connected with the University during the summer months.

A laboratory for *sanitary water analysis* has been equipped with all necessary appliances, and chemical investigation of the water supplies of the state is carried on.

COLLECTIONS*

AGRICULTURAL

At large room in University Hall is devoted to the exhibition of the products of the industrial arts, especially of agriculture. Prominent among the agricultural specimens exhibited is an excellent collection of the sub-species and varieties of Indian corn. There is also a collection of small grains and of grasses; a collection of fibers in various states of manufacture, and a large collection illustrating the forestry of Illinois, Florida, and California. The exhibits made by the University at the Centennial and at the Cotton Exposition at New Orleans find a permanent abode here; large additions have also been made of materials received from the Columbian Exposition of 1893.

BOTANICAL

The herbarium contains nearly all the species of flowering plants indigenous to Illinois, including a complete set of grasses and sedges. The flora of North America is fairly well represented, and a considerable collection of foreign species has been made. A collection of fungi includes a full set of those most injurious to other plants, causing rusts, smuts, molds, etc. A collection of wood specimens from two hundred species of North American trees well illustrates the varieties of native wood.

Plaster casts represent fruits of many of the leading varieties as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

ENGINEERING

The following departments of the College of Engineering have made extensive and valuable collections, which will be found in rooms in Engineering Hall:

*For a more detailed account of the collections in the different departments, see the appropriate subject under each College.

ARCHITECTURE

A large number of specimens of stone, bricks, terra cotta, sanitary fixtures, casts of moldings and of ornament have been accumulated, together with some excellent specimens of industrial arts, models of structures, working drawings of important buildings, 2,500 lantern slides, 20,000 plates and photographs, and the most necessary books.

CIVIL ENGINEERING

The civil engineering department has a large room containing samples of iron, steel, wood, brick, and stone; materials for roads and pavements; models of arches and trusses, one of the latter being full-sized details of an actual modern railroad bridge. The department also possesses a very large collection of photographs and blue-print working drawings of bridges, metal skeleton buildings, masonry structures, and standard railroad construction.

ELECTRICAL ENGINEERING

The department has a large cabinet containing a collection of samples illustrating standard practice in the industrial applications of electricity. There is also a rapidly growing collection of lantern slides, photographs, blue-prints, drawings, pamphlets, and other engineering data.

MECHANICAL ENGINEERING

This department has among other things a partial set of Reuleaux models, together with models of valve gears, sections of steam pumps, injectors, valves, skeleton steam and water gauges, standard packings, steam-pipe coverings, and drop forgings. There are also fine examples of castings, perforated metal, defective boiler plates, and sets of drills, with numerous samples of oil, iron, and steel. A large number of working drawings from leading firms and from the United States Navy Department forms a valuable addition to the above collections.

GEOLOGICAL

Lithology is represented by type collections of rocks (2,900 specimens), arranged to illustrate Rosenbusch, from Voigt and Hochgesang, Dr. L. Eger, and A. Kranz; a type collection from Ward; a large number of ornamental building stones, and a stratigraphic collection to illustrate Illinois geology.

The *mineralogical* collection is especially rich in rock-forming minerals, ores, and materials of economic value. It contains over 7,000 specimens carefully selected to meet the wants of the student.

The *paleontological* collection (43,400 specimens) contains representative fossils from the entire geologic series. It embraces the private collections of Dr. A. H. Worthen, including 650 type specimens; Tyler McWhorter; Rev. Mr. Hertzer; the Ward collection of casts, and a considerable number of special collections representing the fauna and flora of particular groups.

ZOÖLOGICAL

The *zoölogical* collections have been specially selected and prepared to illustrate the courses of study in natural history, and to present a synoptical view of the zoölogy of the state.

The mounted mammals comprise an unusually large and instructive collection of the ruminants of our country, including male and female moose, elk, bison, deer, antelope, etc., and also several quadrumana, large carnivora and fur-bearing animals, numerous rodents, good representative marsupials, cetaceans, edentates, and monotremes. Fifty species of this class are represented by eighty specimens. All the orders, excepting the Proboscidea, are represented by mounted skeletons. There is also a series of dissections in alcohol, illustrating the comparative anatomy of the group.

The collection of mounted birds includes representatives of all the orders and families of North America, together with a number of characteristic tropical, Bornean, and New Zealand forms. The collection is practically complete for Illinois species. There is also a fine collection of the nests and eggs of Illinois birds. A series of several hundred unmounted skins is available for the practical study of species, and the internal anatomy is shown in alcoholic dissections and in mounted skeletons of all the orders.

The cold-blooded vertebrates are represented by a series of mounted skins of the larger species, both terrestrial and marine; mounted skeletons of typical representatives of the principal groups; alcoholic specimens, both entire and dissected, and casts. The alcoholics include series of the reptiles, amphibians, and fishes, the latter comprising about three hundred species. The dissections illustrate the internal anatomy of the principal groups. The casts represent about seventy-five species, nearly all fishes.

The Mollusca are illustrated by alcoholic specimens of all classes and orders, and dissections showing the internal anatomy of typical forms. There are several thousand shells belonging to seventeen hundred species. The collection of Illinois shells is fair but incomplete.

Of the Arthropoda the entomological cabinet contains about three thousand species (principally American), named, labeled, and systematically arranged. There is also a series of Crustacea, some dried, but mostly in alcohol, the latter including a number of dissections.

The lower invertebrates are represented by several hundred dried specimens and alcoholics, and by a large series of the famous Blaschka glass models.

The embryology of vertebrates and invertebrates is illustrated by a set of Ziegler wax models, and several series of slides, sections, and other preparations.

In addition to the above, the extensive collections of the State Laboratory of Natural History are available for illustrative purposes, as well as for original investigation by advanced students.

ART GALLERY

The University art gallery was the gift of citizens of Champaign and Urbana. It occupies a room in the basement of Library Building, and furnishes an excellent collection of models for students of art. In sculpture it embraces thirteen full-size casts of celebrated statues, forty statues of reduced size and a large number of busts and bas-reliefs, making in all over four hundred pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great masterpieces of painting of nearly all the modern schools, and a gallery of historical portraits, mostly large French lithographs, copied from the great national portrait galleries of France.

Other collections of special value to art students embrace a large number of casts of ornament from the Alhambra and other Spanish buildings, presented by the Spanish government; a set of casts from Germany, illustrating German renaissance ornament; a series of art works from the Columbian Exposition; large numbers of miscellaneous casts, models, prints, and drawings, such as are usually found in the best art schools, and a model in plaster and a complete set of drawings of a competitive design by Henry Lord Gay for a monument to be erected in Rome, commemorative of Victor Emanuel, first king of Italy.

LIBRARY

The *library* contains 40,000 volumes and 2,500 pamphlets. The reading room contains 378 periodicals. The library of the State Laboratory of Natural History and that of the Agricultural Experiment Station contain about 7,000 volumes and 16,000 pamphlets. Both these libraries are open to students of the University.

The library and the reading room are open every day, except Sunday, from 8 a. m. until 5 p. m., and from 7 p. m. until 9 p. m. on Mondays, Tuesdays, Wednesdays, and Thursdays.

ADMISSION

Applicants for admission to the freshman class must be at least sixteen years of age.

Entrance may be made at any time, provided the candidate is competent to take up the work of the classes then in progress; but it is better to begin upon the first collegiate day in September.

Admission to the freshman class of the University may be obtained in one of three ways: (a) by certificate from a fully accredited high school; (b) by examination; (c) by transfer of credits from some other college or university.

ADMISSION BY CERTIFICATE FROM ACCREDITED HIGH SCHOOLS

The University employs a high school visitor, whose business it is to inspect the high schools of the state. The University bears the expense of such inspection, but does not send the visitor to any school not already accredited until he receives from it a report with regard to the work it is doing which shows that its course of study is such in quantity and quality as to be worth the time and attention of the University. After inspecting a school the visitor reports upon it to the Faculty of the University, and upon approval the school is added to the list of accredited schools. Students coming to the University from an accredited school are excused from entrance examinations in those subjects which they have pursued there satisfactorily and which are accepted for admission to the University. The University accredits all work which is sufficiently well done. The schools in the list below are therefore not all accredited for the same amount and kind of work.

In all subjects required for admission to the University, other than those for which his school is accredited, the candidate for admission must pass an examination or take the work in the Preparatory School of the University.

Candidates for admission from accredited schools must file with the Registrar, upon entrance, a certificate of graduation and a certified list of the preparatory studies for which they received credit in the high school. Blanks for these certificates must be obtained from the Registrar in advance, and it is better to forward them to him for approval before registration days.

LIST OF ACCREDITED SCHOOLS

School	Superintendent	Principal
Aledo	J. P. Kuntz	F. N. Taylor
Alton	R. A. Haight	J. E. Turner
Amboy	F. W. Dunlap	F. W. Dunlap
Anna	A. L. Bliss	A. L. Bliss
Arcola	G. W. Smith	Nellie Wright
Atlanta	H. H. Edmunds	A. S. Patterson
Augusta	W. W. Wirt	S. D. Faris
Aurora (East)	C. M. Bardwell	W. C. Hazzard
Aurora (West)	A. V. Greenman	Katharine Reynolds
Austin	N. D. Gilbert	B. F. Buck
Batavia (East)	W. E. King	W. E. King
Batavia (West)	T. C. Frye	T. C. Frye
Beardstown	S. S. Beggs	H. J. Jockisch
Belleville	H. D. Updike	H. W. Brua
Belvidere (North)	Arthur J. Snyder	Flora Fellows
Belvidere (South)	Montgomery Moore	Mary Porteous
Bement	E. L. McDuffee	W. N. Tobey
Bloomington	E. M. VanPetten	E. L. Boyer
Blue Island	(Township High School)	J. E. Lemon
Burlington	C. E. Shelton	E. Boppe
Cairo	T. C. Clendenen	John Snyder
Camp Point	C. P. Beale	C. P. Beale
Canton	C. S. Aldrich	A. M. Henderson
Carlinville	E. H. Owen	Annie Otwell
Carollton	Clyde Slone	Lottie Weber

School	Superintendent	Principal
Carthage	W. K. Hill	Rose Kirkpatrick
Centralia	I. F. Mather	Ellen Sherman
Champaign	Joseph Carter	Lottie Switzer
Charleston	J. K. Stableton	Wm. Wallis
Chicago—		
Calumet	E. Benjamin Andrews	A. S. Hall
Englewood	"	J. E. Armstrong
English High and Manual Training	"	A. R. Robinson
Hyde Park	"	Chas. W. French
Jefferson	"	Chas. A. Cook
Lake	"	E. F. Stearns
Lake View	"	J. H. Norton
Marshall	"	L. J. Block
Medill	"	S. B. Sabin
North Division	"	O. S. Wescott
Northwest Division	"	F. P. Fisk
South Division		Jeremiah Slocum
South Chicago	"	C. I. Parker
West Division	"	G. M. Clayberg
Chicago Heights	G. A. Hawkins	F. W. Schacht
Chicago Manual Training	H. H. Belfield, Director.	
Chrisman	J. H. Gardener	J. H. Gardener
Clinton	E. B. Bentley	Bertha Wilcox
Clinton, Ia.	O. P. Bostwick	E. L. Mason
Cobden	J. H. Jenkins	J. H. Jenkins
Danville	J. E. Bryan	B. D. Billinghurst
Davenport, Ia.	J. B. Young	W. D. Wells
Decatur	E. A. Gastman	Frank Hamsher
Delavan	F. L. Calkins	Stella Hoghton
Dixon (North)	H. V. Baldwin	Lydia Williamson
Dixon (South)	Chas. W. Groves	B. F. Bullard
Dubuque, Ia.	F. T. Oldt	F. L. Smart
Dundee	C. H. Watt	Carrie Watson
DuQuoin	D. B. Rawlins	Chas. Knapp
Dwight	G. W. Horton	J. W. Lockhart
East St. Louis	John Richeson	J. E. Miller
Edwardsville	J. M. Parkinson	Walter F. Pike
Effingham	C. V. McReynolds	E. C. Finley

School	Superintendent	Principal
Elgin	M. A. Whitney	E. C. Peirce
Elmwood	L. E. Flanegin	Jeannette Munson
El Paso (West)	H. E. Waits	H. E. Waits
Evanston	(Township High School)	H. L. Boltwood
Evansville, Ind.	W. A. Hester	Robert Spear
Farmer City	C. C. Covey	James Raiburn
Farmington	H. L. Roberts	H. L. Roberts
Flora	Philo Stephenson	Amy Mullikin
Freeport	R. S. Page	S. E. Raines
Fulton	A. Ebersole	Mary Conrath
Galena	J. W. Cupples	O. E. Taylor
Galesburg	W. L. Steele	F. D. Thomson
Galva	F. U. White	Hedwig M. Maul
Geneseo	A. W. Hussey	F. H. Haller
Gibson City	R. G. Jones	H. W. Rudolph
Grand Prairie Seminary (Onarga)		F. C. Demarest
Greenfield	H. G. Russell	Mrs. H. G. Russell
Griggsville	H. G. McCairel	Nora Simmons
Harvard	J. S. Brazier	Jennie McCampbell
Harvey	(Township High School)	J. E. Cable
Henry	Wm. Calhoun	Emma Stone
Hillsboro	Josiah Bixler	Mattie Hunt
Hinsdale	J. M. Frost	Mary MacNair
Hoopeston	S. A. D. Harry	F. V. Clements
Jacksonville	J. W. Henninger	H. S. Weston
Jerseyville	J. Pike	E. B. Shafer
Joliet	Kate Henderson	J. Stanley Brown
Kankakee	F. N. Tracy	C. E. Crosby
Keokuk, Iowa	O. W. Meyer	George E. Marshall
Kewanee	A. C. Butler	Horace Phillips
Lacon	Frank Wescott	Margery Morrison
La Grange	(Township High School)	E. G. Cooley
Lanark	E. S. Hady	Louise C. Winner
La Salle	(Township High School)	Stratton D. Brooks
Le Roy	B. C. Moore	Bertha Rutledge
Lewistown	B. E. Nelson	Georgia T. First
Lexington	Jesse L. Smith	Emma Glossop
Lincoln	F. M. Richardson	Marion Lyons
Litchfield	J. E. Wooters	R. C. Shelenbarger
Lockport	J. E. Hooton	E. L. Tilden

School	Superintendent	Principal
Macomb	R. C. Rennick	R. C. Rennick
Marengo	A. M. McDermott	Charles Shafer
Marseilles	M. A. Kline	F. M. Kline
Mason City	J. R. Sparks	E. A. Naylor
Mattoon	B. F. Armitage	S. F. Smyser
Maywood	J. Porter Adams	C. W. Drake
Mendota (East)	W. R. Foster	W. R. Foster
Mendota (West)	H. H. Robinson	H. H. Robinson
Metropolis	Edward Longbons	A. S. Boucher
Moline	W. J. Cox	A. R. Crittenden
Monmouth	J. C. Burns	E. Sturtevant
Morrison	M. M. Warner	P. F. Burtch
Mound City	Joel Bowlby	Mary Roberson
Mount Carmel	D. W. Gamble	Kate Marsh
Mount Carroll	J. M. McCallie	Ida M. Giggs
Murphysboro	C. W. Parkinson	E. H. Rogers
Nashville	Albert G. Owen	Albert G. Owen
Newton	E. B. Brooks	Electa Ranson
Normal	E. A. Fritter	T. M. Birney
Oak Park	W. H. Hatch	C. J. Hanna
Olney	F. W. Wood	G. D. Wham
Oregon	W. J. Sutherland	Addie Steele
Ottawa	(Township High School)	J. O. Leslie
Paris	J. D. Shoop	W. L. Goble
Paxton	O. J. Bainum	J. E. McKown
Pekin	O. A. Schotts	A. D. Chapman
Peoria	N. C. Dougherty	A. W. Beasley
Pittsfield	W. R. Hatfield	Bertha Cann
Polo	S. M. Abbott	Julia M. Gay
Pontiac	(Township High School)	J. E. Bangs
Princeton	(Township High School)	D. O. Barto
Quincy	A. A. Seehorn	W. F. Geiger
Ridge Farm	H. H. Kidd	H. H. Kidd
Robinson	C. H. Neilson	O. R. Hedden
Rochelle	C. F. Philbrook	Georgia Bennett
Rockford	P. R. Walker	B. D. Parker
Rock Island	R. G. Young	E. A. Robinson
Roodhouse	W. H. Skinner	Harvey White
Rossville	I. A. Smothers	C. N. Boord
Rushville	N. T. Veach	Florence Young

School	Superintendent	Principal
Salem	D. B. Fager	Laura E. Meyers
Sandwich	W. W. Woodbury	Ellen Bell
Savanna	W. S. Wallace	C. N. Jenks
Shelbyville	G. P. Randle	H. C. Miller
Southern Collegiate Institute (Albion)		Frank B. Hines
Sparta	S. B. Hood	L. J. Sexton
Springfield	J. H. Collins	W. W. Helmle
Sterling	(Township High School)	O. L. Miller
Streator	(Township High School)	S. B. Hursh
Sullivan	J. L. Hughes	E. A. Cross
Taylorville	(Township High School)	W. E. Andrews
Terre Haute, Ind.	William Wiley	Charles Meek
Tuscola	Charles Ammerman	G. F. Arps
Urbana	J. W. Hays	H. T. Wilson
Vienna	M. N. McCartney	Ada McCall
Virden	E. A. MacMillan	M. J. Loveless
Virginia	B. H. Scudder	Lydia G. Clark
Warren	M. C. Ladd	M. C. Ladd
Washington	H. G. Veach	H. G. Veach
Waukegan	W. F. Cramer	W. F. Cramer
Western Military Academy	(Upper Alton)	A. M. Jackson
Wheaton	J. B. Russell	W. T. Stebbins
Wilmington	F. M. Crosby	Helen Buss
Winchester	I. M. Jeffords	I. M. Jeffords
Woodstock	C. W. Hart	Retta Peet
Wyoming	J. M. Hutchinson	O. B. Slane
Yorkville	Herbert Bassett	Nannie S. Hill

ADMISSION BY EXAMINATION

Examinations of candidates for admission to the University are held at the University in September (see program, p. 50), and at the opening of second semester. Each candidate must be in attendance during the whole period of the examinations.

The scholarship examinations,* held each year on the first Saturday in June and the day preceding, in the several

*See State Scholarships, p. 225.

counties of the state, afford an opportunity to pass the entrance examinations before coming to the University, since these examinations are taken as equivalents of the regular entrance examinations.

The subjects upon which the entrance examinations are held are described below.

Text-books are named merely to aid in showing the requirements. Equivalents are accepted.

In all cases 36 credits are required, the term credit meaning the work in one subject continuously pursued, with daily recitations, through one of the three terms of the high school year; or, in other words, the work of sixty recitation periods of forty minutes each, or the equivalent in laboratory, or other practice. Of these 36 credits, 28 must be obtained by all candidates in the subjects, and according to the valuation, stated in the prescribed list given below. The remainder of the 36 may be made up by offerings in any of the subjects in the elective list given below, with the following restrictions and provisions:

1. No offering will be accepted in any one of these elective subjects unless at least equal in quantity to the minimum specified in the table. For example: Astronomy is listed for from 1 to 1½ credits. Nothing less than one term's work, that is, one credit, will be accepted, therefore, in that subject.

2. Those who wish to enter upon the courses leading to the degree of bachelor of arts must offer at least three credits in some one foreign language, chosen from among the electives, in addition to the language chosen from among the prescribed subjects in the first list. The language from the elective list may or may not be the same as that offered in the prescribed list. Those who wish to pursue the study of Latin or Greek in the University must, however, offer nine credits in Latin or six in Greek, respectively.

3. Those who wish to enter upon the courses leading to the degree of bachelor of science, in any line of study except agriculture, must offer solid and spherical geometry among their electives.

4. For entrance upon the agricultural courses leading to the degree of bachelor of science, *any* six credits from the elective list will be accepted instead of the six credits in foreign language. But at least two years of foreign language study in the University must be taken by those who make this option.

The amount of work in each subject which, in the judgment of the University authorities, corresponds to the minimum number of credits assigned is shown by the description of subjects below.

SUBJECTS ACCEPTED FOR ADMISSION, WITH CREDITS

Prescribed

Algebra	4 credits
English Composition	3 credits
English Literature	6 credits
French, or German, or Greek, or Latin	6 credits
Plane Geometry	3 credits
History	3 credits
Physical or Biological Science	3 credits

Elective

Astronomy	1 to 1½ credits
Biology	3 to 6 credits
Botany	1½ to 3 credits
Chemistry	2 to 3 credits
Civics	1 to 3 credits
Drawing	1 to 3 credits
French	3 to 9 credits
Geology	2 to 3 credits
Geometry, Solid and Spherical	1 credit
German	3 to 9 credits
Greek	3 to 7 credits
History	3 credits
Latin	3 to 12 credits
Manual Training	1 to 2 credits
Physics	3 credits
Physiography	1½ to 3 credits
Physiology	1 to 3 credits
Zoölogy	1½ to 3 credits

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION

1. Algebra.—Fundamental operations, factoring, fractions, simple equations, involution, evolution, radicals, quadratic equations and equations reducible to the quadratic form, surds, theory of

exponents, and the analysis and solution of problems involving these. The subject as given in Wells's Higher Algebra through quadratic equations, or the same work in Wentworth's Algebra, or an equivalent.

2. ASTRONOMY.—To obtain a single credit for entrance in astronomy, the student must pass an examination covering as much text-book work as is contained in Young's Elements of Astronomy, Todd's New Astronomy, or Howe's Descriptive Astronomy. For 1½ credits, the entrance requirement implies, in addition to the above, some degree of practical familiarity with the geography of the heavens, with the various celestial motions, and with the positions of some of the more conspicuous naked-eye heavenly bodies.

3. BIOLOGY.—The subject as taught in good high schools with laboratory equipment. For the minimum number of credits, one year's work upon such types as are presented in Huxley and Martin's Practical Biology, or Parker's Elementary Biology. For further credits, advanced laboratory work and field collections. Note-books, drawings, collections of specimens, etc., showing work done, must be presented.

4. BOTANY.—A familiar acquaintance is required with the general structure of plants, and of the principal organs and their functions, derived to a considerable extent from a study of the objects; also a general knowledge of the main groups of plants, and the ability to classify and name the more common species. Bergen's Elements of Botany, or Spaulding's Introduction to Botany, indicates the kind of preparation required. Laboratory note-books and herbarium collections must be presented.

5. CHEMISTRY—The instruction must include both text-book and laboratory work. The work should be so arranged that at least one-half of the time shall be given to the laboratory. The course, as it is given in the best high schools in two terms or three terms, respectively, will satisfy the requirements of the University for the two credits or three credits for admission. Remsen's Introduction to Chemistry, Storer and Lindsey's Manual of Elementary Chemistry, and Newth's Elementary Chemistry, are acceptable text-books. The laboratory notes, bearing the teacher's indorsement, must be presented in evidence of the actual laboratory work accomplished. Candidates for admission may be required to demonstrate their ability by laboratory tests.

6. CIVICS.—Such amount of study on the United States constitution, its history and interpretation, as is indicated by any of

the usual high school text-books on civil government, is regarded as sufficient for one term. The work may advantageously be combined with the elements of political economy, or, better, the industrial history of the country.

7. COMPOSITION AND RHETORIC.—Correct spelling, capitalization, punctuation, paragraphing, idiom, and definition; the elements of rhetoric. The candidate will be required to write two paragraphs of about one hundred and fifty words each to test his ability to use the English language. The subject as presented in Genung's Outlines of Rhetoric, Scott and Denney's English Composition, or an equivalent.

8. DRAWING.—Free-hand or mathematical drawing, or both. Drawing-books or plates must be submitted. The number of credits allowed depends on the quantity and quality of the work submitted.

9. ENGLISH LITERATURE.—(a) Each candidate is expected to have read certain assigned literary masterpieces, and will be subjected to such an examination as will determine whether or not he has done so. The books assigned for the next three years are as follows:

1899.—Dryden's Palamon and Arcite; Pope's Iliad, Books I., VI., XXII., and XXIV.; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's The Vicar of Wakefield; Coleridge's Ancient Mariner; De Quincey's Flight of a Tartar Tribe; Cooper's Last of the Mohicans; Lowell's Vision of Sir Launfal; Hawthorne's House of the Seven Gables.

1900.—Dryden's Palamon and Arcite; Pope's Iliad, Books I., VI., XXII., and XXIV.; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's The Vicar of Wakefield; De Quincey's Flight of a Tartar Tribe; Cooper's Last of the Mohicans; Lowell's Vision of Sir Launfal; Scott's Ivanhoe.

1901.—George Eliot's Silas Marner; Pope's Iliad, Books I., VI., XXII., and XXIV.; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's the Vicar of Wakefield; Coleridge's Ancient Mariner; Cooper's Last of the Mohicans; Tennyson's Princess; Shakspere's The Merchant of Venice; Scott's Ivanhoe.

(b) In addition to the above, the candidate will be required to present a brief outline of American Literature.

(c) The candidate will be examined on the form and substance of one or more books, in addition to those named under (a). For 1899, 1900, and 1901 the books will be selected from the lists below. The examination will be of such a character as to require a minute and thorough study of each of the works named, in order to pass it successfully.

1899.—Shakspere's Macbeth; Milton's Paradise Lost, Books I.

and II.; Burke's Speech on Conciliation with America; Carlyle's Essay on Burns.

1900.—Shakspere's Macbeth; Milton's Paradise Lost, Books I. and II.; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison; Tennyson's The Princess.

1901.—Shakspere's Macbeth; Milton's L'Allegro, Il Penseroso, Comus, and Lycidas; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison.

10. FRENCH.—*One year's work.*—The candidate must have a thorough knowledge of elementary grammar and the irregular verbs; must be able to pronounce correctly, and to translate simple spoken French phrases. He must have read some 300 pages of easy prose, including one modern comedy, and must be able to translate ordinary French prose at sight.

Two years' work.—In addition to the above, the candidate must show proficiency in advanced grammar, the essentials of syntax, and elementary composition. The reading of not less than 400 pages of standard authors, including two plays of Molière, is required, and the memorizing of not less than six fables or anecdotes.

Three years' work.—In addition to what has already been described, the candidate must have had further work in composition, and must have memorized not less than six poems or anecdotes. He must further have read not less than 500 pages of standard authors, including Molière, La Fontaine, and Hugo. Some acquaintance with modern lyrics is necessary.

11. GEOLOGY.—Familiarity with the matter found in Scott's Introduction to Geology, or a real equivalent. The student must be able to recognize well-marked types of crystalline and fragmental rocks, and to explain the origin of the topography of the region in which he lives. Additional laboratory and field work will be given such credit as it merits.

12. GEOMETRY.—Plane Geometry, as given in Wells's or Wentworth's Geometry, or an equivalent. Great importance is attached to the ability of the student to solve original problems.

13. GEOMETRY.—Solid and Spherical Geometry, as given in Wells's or Wentworth's Plane and Solid Geometry, or an equivalent.

14. GERMAN.—*One year's work.*—Elementary grammar, especially declension of articles and ordinary nouns and pronouns, use of the strong and the weak adjective, the two conjugations of verbs, with the principal parts and meanings of all the strong verbs, separable and inseparable prefixes, the use of common prepositions, the inverted and transposed sentence order. Practice in writing

German sentences should accompany this work throughout the course, but the German script is not insisted upon. Besides the work in grammar, the student should read not less than 150 pages of easy narrative or descriptive prose, giving careful attention to its translation into good English.

GERMAN.—*Two years' work.*—In addition to the work outlined under the one year's requirement, the pupil should know the syntax of cases, uses of the subjunctive and infinitive, complex sentence structure, uses of modal auxiliaries and of participial constructions. The translation into German of about thirty-five pages of narrative prose should insure ready application of grammatical principles. As an additional reading requirement, from 250 to 300 pages, including one of Schiller's historical dramas and about thirty pages of German lyrics, should be translated. Constant practice in reading German should secure an accurate pronunciation and a feeling of the rhythm and rhetorical form of the works studied.

GERMAN.—*Three years' work.*—The third year's study should aim to secure an easy reading knowledge of the language. Accurate and idiomatic translations into English, constant practice in sight translation and in writing from dictation should be insisted upon. Standard prose of the grade represented by Heine, Freytag, or Dahn, not less than 100 pages should be read, together with selections from classic poetry. Lessing's Minna von Barnhelm and Goethe's Egmont or Iphigenie auf Tauris are especially recommended. Additional work in prose composition, or in the writing of paraphrases of the texts read, should insure the ability to write simple German.

15. GREEK.—To obtain three credits, the exercises in any of the beginning books, and one book of the Anabasis, or its equivalent, must be offered. For six credits, two books of the Anabasis and three of Homer, or their equivalents, additional to the above, must be presented.

16. HISTORY.—At least one year in one of the following subjects: (a) The History of England and of the United States; (b) General History; (c) The History of Greece and Rome. The statement of requirements in each subject implies the use of a substantial text-book, together with some elementary training in the use of large reference books.

17. LATIN.—*One year's work, three credits.*—Such knowledge of inflections and syntax as is given in any good preparatory Latin book, together with the ability to read simple fables and stories.

Two years' work, six credits.—Four books of Cæsar's Gallic

War, or its equivalent in Latin of equal difficulty. The ability to write simple Latin based on the text.

Three years' work, nine credits.—Six orations of Cicero. The ability to write simple Latin based on the text. The simpler historical references and the fundamental facts of Latin syntax.

Four years' work, twelve credits.—The scansion of hexameter verse, six books of Vergil, with history and mythology.

18. MANUAL TRAINING.—Experience in the use of wood-working tools will be required. Forge, foundry, or machine work may be substituted for wood work. The number of credits allowed will depend upon the time spent upon the subjects and the technical knowledge obtained.

19. PHYSICAL OR BIOLOGICAL SCIENCE.—For this there may be offered any one of the following subjects or combination of subjects: Physics, one year; chemistry, one year; botany and zoölogy, each a half year; biology, the study of plant or animal types, one year.

The subjects must be taught in part by laboratory methods and the pupil's note-books must be submitted. Other evidences of work done, as illustrative drawings, collections of specimens, etc., should be presented. Examinations cover the subject-matter as presented in text-books in most common use in high schools. See also the descriptions given under the several subjects.

20. PHYSICS.—The elements of physical science as presented in such text-books as Appleton's School Physics, or Avery's Elements of Natural Philosophy, or Carhart and Chute's Elements of Physics, or Gage's Elements of Physics. The candidate must have had laboratory practice equivalent to that described in the laboratory text-books of Hall and Bergen, Allen, or Chute. The candidate's laboratory note-book will be accepted as part of the examination.

21. PHYSIOGRAPHY.—The amount and character of the work required for the minimum credit may be seen by referring to Mill's Realm of Nature.

For additional credits, the principles of climatology, ability to read physical and contour maps, interpretation of weather maps, and forecasting of weather, etc., will be considered.

22. PHYSIOLOGY.—For one credit are required the anatomy, histology, and physiology of the human body and the essentials of hygiene, taught with the aid of charts and models to the extent given in Martin's Human Body (Briefer Course). For more than one credit, the course must have included practical laboratory work on the part of the student. The number of credits, beyond one,

will be determined in each case according to the quantity and quality of the work.

23. ZOÖLOGY.—Field, laboratory, and text-book work to the amount of a half year in the high school. Colton's Practical Zoölogy, the zoölogical part of Huxley and Martin's Practical Biology, or of Parker's Elementary Biology, will satisfy the laboratory requirements.

PROGRAM OF EXAMINATIONS, SEPTEMBER 14-19, 1899

All persons who wish to enter the University in September, 1899, except those holding certificates of graduation from accredited schools and scholarship certificates, and those for whom a transfer of all entrance credits from some other college or university has already been approved, must present themselves at the Registrar's office, Library Hall, at 9 o'clock a. m., Thursday, September 14th. At that time applications for admission will be received, and applicants will be given all necessary directions as to examinations.

The program of examinations is as follows:

History, 3 or 6 credits	Thursday	1:00 p.m.
Botany, 1½ or 3 credits	Thursday	3:30 p.m.
English Literature, 6 credits	Friday	8:00 a.m.
English Composition, 3 credits	Friday	10:30 a.m.
Latin, 3 or 6 credits	Friday	1:00 p.m.
Physics, 2 or 3 credits	Friday	3:30 p.m.
Algebra, 4 credits	Saturday	8:00 a.m.
Astronomy, 1 to 1½ credits	Saturday	10:30 a.m.
Geology, 2 or 3 credits	Saturday	10:30 a.m.
Geometry, Plane, 3 credits	Saturday	1:00 p.m.
Geometry, Solid, 1 credit	Saturday	2:45 p.m.
Physiology, 1 or 3 credits	Saturday	3:30 p.m.
German, 3 or 6 credits	Monday	8:00 a.m.
Zoölogy, 1½ or 3 credits	Monday	10:30 a.m.
French, 3 or 6 credits	Monday	1:00 p.m.
Chemistry, 2 or 3 credits	Monday	3:30 p.m.
Latin, 7 to 12 credits	Tuesday	8:00 a.m.
French, 7 to 9 credits	Tuesday	10:30 a.m.
German, 7 to 9 credits	Tuesday	10:30 a.m.
Biology, 3 to 6 credits	Tuesday	1:00 p.m.
Physiography, 1½ to 3 credits	Tuesday	3:30 p.m.
Civics, 1 or 3 credits	Tuesday	3:30 p.m.

ADMISSION BY TRANSFER FROM OTHER COLLEGES AND UNIVERSITIES

A person who has entered another college or university of recognized standing will be admitted to this University upon his presenting a certificate of honorable dismissal from the institution from which he comes and an official statement of the subjects upon which he was admitted to such institution, provided it appears that the subjects are those required here for admission by examination, or real equivalents. Candidates, to enter the University in this way, should submit such papers to the Registrar before the time of entrance, so that all doubtful points may be cleared up in advance.

ADMISSION AS SPECIAL STUDENTS

Persons over twenty-one years of age, not candidates for a degree, may be admitted to classes, after satisfying the President and the professor in charge of the department in which such classes are taught, that they possess the requisite information and ability to pursue profitably, as special students, the chosen subjects. Such students are not matriculated; they pay a tuition fee of seven dollars and a half a semester, in addition to the regular incidental fee of twelve dollars.

ADMISSION TO ADVANCED STANDING

After satisfying in some of the ways already enumerated all the entrance requirements for admission to the University, and after matriculating, the applicant for advanced standing may secure such standing either by examination or by transfer of credits from some other college or university.

1. *By Examination.*—Candidates for advanced standing, not from other colleges or universities, may secure such standing on examination. In the case of freshman students seeking advanced standing on the basis of their preparatory

work, such standing shall be granted after satisfactory examination only, unless the applicants are from fully accredited schools. In that case a transfer of credits may be made as provided below.

2. *By Transfer of Credits.*—Credits from other colleges or universities may be accepted by the Faculty for advanced standing; but at least one year's work in residence at the University is required of all candidates for a bachelor's degree.

In all cases, a certificate of honorable dismissal is required, together with a certified record of work done in the institution from which the applicant comes. These should be presented for approval some time before the student enters for work.

Upon approval of the Faculty freshmen may receive credit for advanced work done in fully accredited high schools.

REGISTRATION

At the beginning of each semester each student must present himself for registration within the time set for that purpose, before the formation of classes, and he must be present at the first exercise of each class he is to attend.

EXAMINATIONS

Examinations are held as often as in the judgment of the instructor the necessities of the work require. Examinations are also given at the close of each semester, on the work of the semester, in all subjects except those whose character renders it unnecessary or impracticable.

A record is kept of each student's standing.

SEMESTERS AND RECESS

The University year is divided into semesters each covering eighteen weeks of instruction. There is a recess of two weeks at the Christmas holidays.

For dates of opening and closing, see Calendar, p. 5.

GRADUATION

In all cases credit for one hundred and thirty "semester hours" (see p. 167) is required for graduation. The candidate for a degree in any course must complete all the subjects prescribed for graduation in that course, and when, in doing this, he does not gain the necessary credit of one hundred and thirty hours, he must make up the deficiency by the election of other courses.

The combinations of studies under which a student may graduate are too numerous to describe here; they are given under the separate colleges and schools.

ADMINISTRATION OF THE UNIVERSITY

GOVERNMENT

The government of the University is vested by the Trustees primarily in the President of the University, in the Faculty, in the Council of Administration, and in the Deans. The President is the executive head of the University.

The Dean of the General Faculty has general oversight of the instructional work of the University, and especial supervision of the graduate school. By order of the Board of Trustees he also fills the office of Vice-President.

The Dean of each college is responsible for the enforcement of all University regulations within his college.

The Council of Administration is composed of the President, the Dean of the General Faculty, the Dean of the Woman's Department and the Deans of the separate colleges. It constitutes an advisory board to the President, *and has exclusive jurisdiction over all matters of discipline.*

The Council does not exercise general legislative functions, but when any matter arises which has not been provided for by rule or common usage or legislative action by the General Faculty, and which cannot be conveniently laid over till the next meeting of the General Faculty, the Council may act upon the same according to its discretion.

The determination of the general internal policy of the University is in charge of the Faculty.

The faculties of the different colleges and schools of the University are composed of the members of the corps of instruction of these colleges and schools, and have jurisdiction over all matters which pertain exclusively to these organizations, subject always to higher University authority.

ORGANIZATION

For the purpose of more efficient administration, the University is divided into several colleges and schools. This division does not imply that the colleges and schools are educationally separate. They are interdependent and together form a unit. In addition to the courses mentioned as given in each college and school, instruction in military science and physical training is provided. The organization is as follows:

I. The College of Literature and Arts.
II. The College of Engineering.
III. The College of Science.
IV The College of Agriculture.
V. The Graduate School.
VI. The School of Library Science.
VII. The School of Music.
VIII. The School of Law.
IX. The School of Medicine.
X. The School of Pharmacy.

THE COLLEGE OF LITERATURE AND ARTS

The College of Literature and Arts offers—

1. General courses, classified according to the principal line of work chosen.

2. Specialized courses, or courses under the group system, including—

a. The Classical Group.
b. The English Group.
c. The German and Romanic Language Group.
d. The Latin and Modern Language Group.
e. The Philosophical Group.
f. The Political Science Group.

THE COLLEGE OF ENGINEERING

The College of Engineering offers courses—

1. In Architecture.
2. In Architectural Engineering.
3. In Civil Engineering.
4. In Electrical Engineering.
5. In Mechanical Engineering.
6. In Municipal and Sanitary Engineering.

THE COLLEGE OF SCIENCE

The College of Science offers courses arranged in four groups, as follows—

1. The Chemical and Physical Group.
2. The Mathematical Group.
3. The Natural Science Group.
4. The Philosophical Group.

THE COLLEGE OF AGRICULTURE

The College of Agriculture offers—

1. A course leading to Animal Husbandry as a specialty.
2. A course leading to Horticulture as a specialty.
3. Ten weeks' work, beginning after the holiday recess, to students not otherwise enrolled.

THE GRADUATE SCHOOL

The Graduate School offers courses in—

1. Agriculture.
2. Engineering.
3. Literature, Philosophy, and the Arts.
4. The Sciences.
5. Law.

An enumeration of the departments of graduate study is given at the beginning of "General Description of Courses," (p. 167), and the separate graduate courses offered are described in connection with the proper subjects in the list of courses which there follows.

THE SCHOOL OF LIBRARY SCIENCE

The School of Library Science, or the State Library School, offers a course of study, extending over four years, in preparation for the practice of the work of a librarian. The course leads to the degree of bachelor of library science.

THE SCHOOL OF MUSIC

The School of Music offers courses in vocal and instrumental music, leading to the degree of bachelor of music.

THE LAW SCHOOL

The Law School offers a course of study leading to the degree of bachelor of laws.

THE SCHOOL OF MEDICINE

The School of Medicine offers a course of study leading to the degree of M.D.

THE SCHOOL OF PHARMACY

The School of Pharmacy offers a course in all branches necessary to a complete scientific and practical knowledge of pharmacy, including pharmacy, chemistry, materia medica, botany, physics, and physiology. The course leads to the degree of graduate in pharmacy or to that of pharmaceutical chemist.

COLLEGE OF LITERATURE AND ARTS

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT.
DAVID KINLEY, PH.D., DEAN, Economics.
THOMAS J. BURRILL, PH.D., LL.D., Botany.
SAMUEL W. SHATTUCK, C.E., Mathematics.
CHARLES W. ROLFE, M.S., Geology.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Art and Design.
HERBERT J. BARTON, A.M., Latin.
CHARLES M. MOSS, PH.D., Greek.
DANIEL K. DODGE, PH.D., English.
ARNOLD TOMPKINS, PH.D., Pedagogy.
ALBERT P. CARMAN, SC.D., Physics.
EVARTS B. GREENE, PH.D., History.
GEORGE T. KEMP, M.D., PH.D., Physiology.
GEORGE W. MYERS, PH.D., Astronomy.
EDGAR J TOWNSEND, PH.M., Mathematics. [On leave.]
JACOB K. SHELL, M.D., Physical Training.
LEWIS A. RHOADES, PH.D., German.
VIOLET D. JAYNE, A.M., English.
HARRY S. GRINDLEY, SC.D., Chemistry.
T. ARKLE CLARK, B.L., Rhetoric.
HERMAN S PIATT, PH.D., Romanic Languages.
ARTHUR H. DANIELS, PH.D., Philosophy.
GEORGE D. FAIRFIELD, A.M., Romanic Languages.
CHARLES W. TOOKE, A.M., Public Law and Administration.
FRANK SMITH, A.M., Zoölogy.
JOHN E. McGILVREY, A.B., Pedagogy.
HENRY L. SCHOOLCRAFT, A.M., History.

NEIL C. BROOKS, PH.D., German.
JENNETTE E. CARPENTER, O.M., Physical Training.
GEORGE A HUFF, JR., Coach of Athletic Teams.
AGNES S. COOK, A.B., Rhetoric.
MARTHA J. KYLE, A. M., Rhetoric.
GEORGE H. MEYER, A. M., German.
JOHN P. HYLAN, PH.D., Psychology.
MATTHEW B. HAMMOND, PH.D., SECRETARY, Economics and Sociology.
HENRY L. COAR, PH.D., Mathematics.
CHARLES W. YOUNG, B.S., Botany.
STANLEY M. LEWIS, Art and Design.
LUCY H. CARSON, PH.B., Fellow, English.
EMMA E. SEIBERT, B.S., Fellow, Art and Design.
ALEXANDER D. DUBOIS, Military.

AIMS AND SCOPE

The College of Literature and Arts includes those branches usually comprised in a department of philosophy and arts, with the exception of the natural sciences. The aim of the College is a double one: to furnish a liberal education, and to afford the largest opportunity for specialization in literary and philosophical subjects. It is believed that this double purpose can be best accomplished by a judicious combination of disciplinary and information studies, which, while so directing the work of the student as to secure the desired mental training, shall also allow him large liberty of choice both in his main lines of work and in subjects auxiliary thereto.

In accordance with this general plan, it is provided that students may graduate either under the general course system or under the specialized course, or group, system.

THE GENERAL COURSE SYSTEM

A general course is one in which less than three years' work in any one subject, or group of allied subjects, is required for graduation, and in which no thesis is required.

In the general courses a minimum of prescribed work is laid out for the first two years. The whole of the work of the first year, and part of that of the second, is prescribed. The work for the rest of the course is elective. Within the limits of the prescribed work, however, the student is permitted a choice of lines of work.

In choosing his electives, each student must select at least two subjects from the major electives.

In the choice of his electives other than his major work the student may take a minimum of work in each of a maximum number of subjects, or he may take a maximum amount of work in the minimum number of subjects necessary to fill up his time according to the rules of the University.

The elective courses open to the students of the College include subjects from the Colleges of Science and Engineering. The sciences are not an integral part of the work of the College, but the training derived from their study is so important a part of a liberal education that every student of the College is earnestly advised to extend his study of them so far as may be.

REQUIREMENTS FOR GRADUATION UNDER THE GENERAL COURSE SYSTEM

Credit for 130 hours,* including the prescribed military and physical training, are required for graduation under the general course system. Every student must take the prescribed subjects; in addition, he must select at least two subjects from the list of major electives, and he must then choose work sufficient to yield him the remainder of his necessary credits.

No credits will be granted in any subject except according to the enumeration given. For example, if work is offered in a subject for from five to ten hours, no credit will be allowed for less than five hours' work.

* For explanation of "hours" see p. 167.

THE SPECIALIZED COURSE, OR GROUP, SYSTEM

A specialized, or group, course is one which contains at least twenty semester hours' work in a single subject preceding the senior year, followed by an additional ten hours in that subject during the senior year, and the writing of an acceptable thesis. No student may be enrolled in a specialized course without the permission of the head of the department in which he wishes to do his principal work, and each student who wishes to be so enrolled must specify the course he desires to enter not later than the beginning of his junior year.

In the specialized course, or group, system the prescribed work is the same as in the general course system. The other work necessary for graduation is to be obtained in the subjects of the group which the student enters.

Only those students who pursue a specialized course shall, as a rule, be selected from this College for fellowships, scholarships, and other similar University honors.

REQUIREMENTS FOR GRADUATION UNDER THE SPECIALIZED COURSE, OR GROUP, SYSTEM

One hundred and thirty hours, including military and physical training, together with an acceptable thesis, are required for graduation under the group system. Every student must take the prescribed subjects. In addition he must, not later than the beginning of his junior year, specify the group in which he wishes to graduate. He must at this time select one subject in the group as his major subject, the study of which, alone or with the subjects designated as specifically preparatory* to it, he must pursue during the remaining two years, securing therein at least thirty hours of credit. He must also select, with the approval of the head of the department in which his major subject lies, a sufficient number of other studies to yield him the neces-

*See p. 63.

sary hours of credit, and he must present an acceptable thesis.

The thesis required for graduation must be on a topic connected with the student's major study. It must present the results of investigation made under the immediate supervision of the instructor during the last year of the student's course. This work of investigation shall be the required work in the major subject, in whole or in part, during that year, and shall receive credit like any other study. Separate credit will not be given for the thesis.

No credit will be allowed in any subject except according to the enumeration given, and the same work shall not be credited both as major and as minor work.

The groups are as follows:

The *Classical Group,* including Greek and Latin as the major subjects. One of these languages must be taken for thirty, the other for twenty, hours.

The *English Group,* including the Scandinavian languages. Students in this group must take two years of French or German before the beginning of the junior year. Those electing the course in language must have at least two years of German.

The *German and Romanic Language Group.* Either German or French may be taken as a major, but as a condition of graduation twenty hours of credit in the other must be secured. Besides the required work in English, all students must elect additional English sufficient to make a total of at least ten hours. Students of marked ability, taking French as a major, will be advised to take the courses offered in Spanish or Italian.

The *Latin and Modern Language Group,* including Latin as a major, and German and French as minors. Ten hours in one minor are required.

The *Philosophical Group,* including pedagogy, philosophy, psychology, and mathematics as major subjects. In this group the second year of the student's work is devoted to studies specifically preparatory to the principal subject, which is itself taken up at the beginning of the third year.

Students in this group who make *philosophy* a major must, in the second year, make ten hours of credit from among these subjects: Anthropology, psychology, economics 17 (sociology), Greek 3.

Those who make *psychology* their major subject must, in their second year, make ten hours from among these subjects: botany 1, 2; economics 17; philosophy 2, 6, 8; physiology 4; zoölogy 1.

When *pedagogy* is the major, the work specifically preparatory is logic (philosophy 1a or 1b), outlines of philosophy (philosophy 2), and elementary and educational psychology (psychology 1 and 4).

Those students who make *mathematics* their major work must take the courses in mathematics numbered 2, 4, 6, 7, 9, 10, 11, 15, 16, 17, and may elect as many more courses as desired. They must also make ten hours in philosophy, (including philosophy 1), and either twenty hours in German or ten in French.

The *Political Science Group*, including economics, history, and public law and administration. All students in this group must take the three elementary courses: history 1, economics 1, a and b, and public law and administration 1; and must also secure five hours in physiography, and at least three hours in philosophy, selected from courses 1, 2, 3, and 4. All students in the group must take one year's work in either French or German, before the beginning of the junior year, or must furnish satisfactory evidence of their ability to use at least one of the languages.

The only degree given in this College is that of A.B.

CLASSIFICATION OF SUBJECTS

PRESCRIBED

Advanced Algebra (Math. 1, 2); 2 or 3 hours.
English 1; 5 hours.
French 1, German 1 and 3, Greek 1, 2, 3, or Latin 1; 10 hours.
Geometry, Solid and Spherical; 3 hours.
History 1, 2, 6; 6 hours.

Logic (Philosophy 1a or 1b); 3 hours.
Military 1, 2; 5 hours.
Physical Training—
For men, 2½ hours.
For women, 3 hours.
Natural Science; 10 hours.
Rhetoric 1; 6 hours.
Trigonometry (Math. 3, 4); 3 or 2 hours.

ELECTIVE

MAJOR COURSES

Economics 1 to 19; 20 to 48 hours.
English 1 to 15; 20 to 40 hours.
French 1 to 4; 20 to 36 hours.
German 1, 3 to 13; 20 to 50 hours.
Greek 1 to 8; 20 to 30 hours.
History 1 to 12; 20 to 49 hours.
Latin 1 to 9; 20 to 50 hours.
Mathematics 1 to 24; 20 to 57 hours.
Pedagogy 1 to 4; 20 hours.
Philosophy 2 to 8; 20 to 21 hours.
Public Law and Administration 1 to 9; 20 to 30 hours.
Psychology 1 to 5; 20 to 26 hours.
Rhetoric 1 to 5; 20 to 26 hours.

MINOR COURSES

The necessary number of hours additional to those provided for in the prescribed subjects and the chosen major electives may be secured from any of the subjects offered in the College of Literature and Arts, or in the College of Science, the requirements for which the student can meet. Not more than twenty hours in Art and Design may be counted toward the degree, nor more than five hours in physical training, including the amount prescribed. Course 12 in library science may be taken as a minor. Certain courses offered in the College of Engineering may also be chosen; as, for example, history of architecture (Arch. 6); heating and ventilation (Arch. 13), etc.

The attention of young women is especially called to the courses grouped under Household Economics, p 165.

COURSE OF INSTRUCTION

All the prescribed subjects must be *finished by the end of the sophomore year.* The following statement gives the years and semesters in which they occur:

FIRST YEAR.

Fifteen to eighteen hours' work per week, exclusive of military and physical training, must be chosen each semester from among the following subjects: those in italics must be in the list chosen. It is expected that five hours in natural science will be taken each semester from the options named below; but if one desires to pursue an extended course in physics instead, he may take up that subject in the sophomore year.

First Semester—

History: Mediæval and Modern European History (Hist. 1), or 19th Century (Hist. 2); 2 or 3 hours.

Language and Literature: English 1, 5 hours; French 1, or German 1, or Greek 1, or Latin 1, 5 hours; *Rhetoric* 1, 3 hours.

Mathematics: Advanced Algebra and Trigonometry (Math. 1, 2 or 3, 4), 5 hours.

Military: Tactics and Drill (Mil. 1, 2); 2 hours.

Natural Science: Astronomy 5, or Biology 1, or Botany 2, or Chemistry 1, or Physiography 1, or Zoölogy 5 or 6; 5 hours.

Physical Training—

For men—Physical Training 1, 3; 1¼ hours.

For women—Physical Training 7, 9; 2 hours.

Second Semester—

History: Mediæval and Modern European History (Hist. 1), or 19th Century, or Roman History (Hist. 2 or 6), 2, 3, or 5 hours.

Language and Literature: French 1, or German 8, or Greek 2, or Latin 1, continued as begun in the first semester; 5 hours. *Rhetoric* 1, continued; 3 hours.

Mathematics: Solid and Spherical Geometry; 3 hours.

Military: Drill (Mil. 2); 1 hour.

Natural Science: Astronomy 4, or Botany 1, or Chemistry 2 or 2a or 3a or 3b, or Geology 3, or Physics 2, or Physiology 4, or Zoölogy 1, 6, or 7; 5 hours.

Physical Training—

For men—Physical Training 1, 3; 1¼ hours.

For women—Physical Training 7; 1 hour.

SECOND YEAR

Fifteen to eighteen hours' work per week, exclusive of military and physical training, must be chosen each semester. This work *must include all of the prescribed subjects which were not taken in freshman year.* (See pp. 64, 65, and the classification under first year.) It must also include the following:

Logic: (Phil. 1a first semester, or Phil. 1b second semester); 3 hours.

Military: Drill (Mil. 2) both semesters; 2 hours.

The remaining hours may be made up by the election of any subjects the requirements for which the student can meet.

THIRD AND FOURTH YEARS

The studies of these are all elective.

DESCRIPTION OF DEPARTMENTS

ART AND DESIGN

This work subserves a threefold purpose: (1) It affords students the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. (2) It offers such as have a talent for art the best facilities for pursuing studies in all branches of fine art. (3) It offers those who wish to become teachers of drawing special opportunities for study.

Special students, not otherwise connected with the University, may enter this department upon payment of moderate fees. For such students a fourth year of work is offered in drawing, painting, modeling, or design, as they may elect.

ECONOMICS

The work in economics for undergraduates is so arranged that the student can take a continuous course for from one to three years. The courses are designed to cover as large a field as possible in the literature of the subject, and to present all disputed matters from different points of view.

Minor courses in sociology are provided for in the department.

ENGLISH LANGUAGE AND LITERATURE

The courses are designed to give a continuous view of the twofold subject from the earliest times to our own day. In the junior and senior years double courses are offered, so that students, having had the fundamental work of the sophomore year, may, if desired, confine themselves either to philology or to literature. The aim in the study of literature is to approach the works of an author from the philosophical, emotional, and esthetic, as well as from the merely linguistic and historical points of view.

FRENCH

(See Romanic Languages, p. 73.)

GERMAN

Four years of instruction are offered in this subject. By alternating the work in the third and fourth years, provision is made that students whose knowledge of the language at entrance enables them to begin with the third year's work, can pursue the subject throughout their course. The work of the first and second years is intended to give the student the best possible reading knowledge. In the second year an opportunity is offered those whose special interest in the language is as a tool in scientific or technical studies, to read scientific works during the winter and spring terms; but ability to translate readily and accurately is, in all cases, especially emphasized.

The work of the third and fourth years consists of a critical study of the classic poets and modern writers, and of lectures in German literature.

GREEK

The general purposes of the courses laid out in this subject are: first, to teach the Greek language; second, to train students to appreciate its literature; and third, to call attention to those numerous problems in the history, thought, and institutions of the Greeks, which illustrate similar phenomena noticeable among ourselves. To accomplish the first object, due attention is paid to the principles of grammar, particularly by making the syntax appear as the evidence of orderly mental procedure, and by continual practice in extemporaneous translation. The second is effected by a study of the surroundings and spirit of an author, and of those literary devices which give character to his productions. The third end is reached through familiar talks upon suitable topics as they are met.

HISTORY

In the courses offered by this department the effort is made, not merely to give students a general knowledge of historical facts, but also to give them some conception of the aims and methods of historical science, and of the materials with which it deals. To this end exercises in historical investigation, more or less elementary, will form a prominent part of the work in all the higher undergraduate courses, as well as in the seminaries.

ITALIAN

(See Romanic Languages, p. 73.)

LATIN

The courses at present offered in Latin are nine in number and extend over three years. The first year's instruction is, as far as needed, grammatical, prominence being given to Latin writing as the best method of acquiring a mastery of the language.

As soon as this preliminary work is done, the attention is directed to two ends. The first is the acquisition of power to read the language with ease and pleasure. The thought is constantly emphasized that students are not simply reading Latin—they are reading some of the great literary masterpieces of the world, and should enjoy them as such. The second aim is to introduce the student to the daily life of the Roman; to make his home life vivid, his political life a reality. The contribution of the Roman world to the language, literature, and institutions of our time is so great that an intimate acquaintance with that life is of the highest educational value.

The courses offered include a teachers' class, the work of which is based on the needs of those teaching preparatory Latin, and methods of presentation, difficulties, aims, and results are discussed. The members of the class do the work which they, as teachers, should require of their pupils, and at intervals take charge of the recitation.

MATHEMATICS

The object of the instruction in pure mathematics is to promote habits of mental concentration and continuity of thought, to develop the capacity to form and combine abstract conceptions, and to cultivate deductive reasoning. The course is so arranged as to meet the requirements of those who wish to fit themselves for teaching, and of those who study the science for the love of it.

The mathematical courses open to students of the College of Literature and Arts, include the entire offering of the University in mathematics.

MILITARY SCIENCE

The work of the department of military science is prescribed for all male students. The department therefore belongs to all the colleges alike. A full description of the work offered and of the aims and scope of the department will be found farther on in the catalogue. (See p. 261.)

PEDAGOGY

The work of the department of pedagogy is designed for those who desire a thorough and philosophic knowledge of the principles and practice of teaching. It seeks to give a comprehensive insight into school education, its phases, and problems; and thus to be of special service to those who may hold important positions in school work. The course is elastic, and, so far as possible, will be adjusted to suit the needs of the students who take the work.

PHILOSOPHY

The work in this department includes history of philosophy, metaphysics, ethics, and logic, and is so arranged that the student may take a continuous course for either one or two years.

The courses are planned to meet the needs of those who make philosophy their specialty, and also of those who desire an acquaintance with the subject as a means of general culture. It is the constant aim to emphasize the meaning and interest of philosophy and the relations of its problems to the life of man.

PHYSICAL TRAINING

The work of this department is offered to all students in the University. Consequently the department properly belongs in all the colleges. A full description of its aim and scope is given farther on. (See p. 263.)

PUBLIC LAW AND ADMINISTRATION

The courses in public law and administration are planned with two purposes in view: (1) to give, in conjunction with the instruction in economics and history, that information and training which are requisite to intelligent citizenship; and (2) to afford opportunities for advanced work to those who may desire more thorough preparation, either for active political life or preliminary to the study of law.

To meet these ends, the work is so arranged that the subject may be pursued continuously for three years. The elementary courses are given every year, while the advanced courses are offered in alternate years.

The courses, as a whole, are intended to cover the theory of the state, its organization, and practical operation.

PSYCHOLOGY

Besides the opportunity offered in this department for scientific training and original research, there is also given a basis for general culture. The student is taught to observe psychic phenomena in himself and in his social surroundings, both individual and collective, and is thus given a standpoint from which to approach social and ethical questions intelligently.

Historically, psychology is treated with a view to giving the student a connected idea of the development of the subject. Its experimental development and recent phases are given special attention, with particular comment upon the probable lines of its future development, and the place in human economy which it aims to fill.

RHETORIC AND ORATORY

The courses offered in rhetoric and oratory are five in number, and extend over four years. The object of the courses is to acquaint the student with the principles of rhetoric, to teach him correctness and effectiveness in the writing of English, and to give him some practice in the oral expression of his ideas. In the first year's work a text-book is used, supplemented with lectures. One or two short themes a week are required from each student. These are read, carefully criticized, and, when necessary, are handed back to be rewritten. More emphasis is put upon practice than upon theory. A year's work in the writing of daily themes is intended to give practice in higher English composition. The courses in argumentation and oral discussions give opportunity for the writing and delivery of argumentative discourse.

ROMANIC LANGUAGES AND LITERATURES

This department offers four years of instruction in French and one year each in Spanish and Italian. In the elementary courses the main object is to give the student correct pronunciation, grammatical knowledge, and the ability to read the languages with facility. In the second year attention is especially directed to various phases of nineteenth century literature; effort is made to ground the student thoroughly in the modern idiom, and lectures are given upon the outlines of French literature. The work of the third year is a study of the masterpieces of the seventeenth century. Ability to understand readily spoken French is requisite for admission to this course. The field of the fourth year's work is literature and society in the eighteenth century. A graduate course is offered in Old French; some of the more important texts are studied, and attention is given to the origins of the language.

SOCIOLOGY

See economics in the philosophical group in the College of Science, p. 130, and courses 15, 16, and 18 under economics, in the "General Description of Courses," p. 197. See also, for allied courses, anthropology, p. 170, and psychology, p. 241.

SPANISH

See Romanic Languages.

COLLEGE OF ENGINEERING

FACULTY

Andrew S. Draper, LL.D., President.
N. Clifford Ricker, M.Arch., Dean, Architecture.
Thomas J. Burrill, Ph.D., LL.D., Bacteriology.
Samuel W. Shattuck, C.E., Mathematics.
Ira O. Baker, C.E., Civil Engineering.
Arthur N. Talbot, C.E., Municipal and Sanitary Engineering; Mechanics.
Arthur W. Palmer, Sc.D., Chemistry.
Frank F. Frederick, Art and Design.
Samuel W. Parr, M.S., Applied Chemistry.
Daniel K. Dodge, Ph.D., English.
Lester P. Breckenridge, Ph.B., Mechanical Engineering.
David Kinley, Ph.D., Economics.
Albert P. Carman, Sc.D., Physics.
George W. Myers, Ph.D., Astronomy and Applied Mathematics.
Jacob K. Shell, M.D., Physical Training.
Lewis A. Rhoades, Ph.D., German.
Edgar J Townsend, Ph.M., Mathematics. [On leave.]
James M. White, B.S., Architecture.
William D. Pence, C.E., Civil Engineering.
William Esty, B.S., A.M., Electrical Engineering.
Violet D. Jayne, A.M., English.
William H. VanDervoort, M.E., Mechanical Engineering.
Harry S. Grindley, Sc.D., Chemistry.
T. Arkle Clark, B.L., Rhetoric.
Herman S Piatt, A.M., French.

Fred A. Sager, B.S., Physics.
Cyrus D. McLane, B.S., Architecture; Mechanics.
James D. Phillips, B.S., General Engineering Drawing.
Seth J. Temple, B.S., Secretary; Architecture.
Oscar Quick, A.M., Physics.
William H. Browne, Jr., A.B., Electrical Engineering.
Agnes S. Cook, A.B., Rhetoric.
George H. Meyer, A.M., German.
William C. Brenke, B.S., Mathematics.
Charles T. Wilder, B.S., Photography; Blue Prints.
Neil C. Brooks, Ph.D., German.
Edward L. Milne, B.S., Mathematics.
Martha J. Kyle, A.B., Rhetoric.
Henry L. Coar, A.M., Mathematics.
Edward C. Schmidt, M.E., Mechanical Engineering.
Charles V. Seastone, B.S., Mechanics.
Hubert V. Carpenter, B.S., Physics.
Harry W. Baum, B.S., Civil Engineering.
Stanley M. Lewis, Art and Design.
John Nevins, B.S., General Engineering Drawing.
Edd C. Oliver, B.S., Mechanical Engineering.
Harry C. Marble, B.S., Electrical Engineering.
Cyril B. Clark, Machine Shop.
Albert R. Curtiss, Wood Shop.
Henry Jones, Forge Shop.
Joseph H. Wilson, Foundry.
Alexander D. DuBois, Military.

AIMS AND SCOPE

The purpose of the College of Engineering is thoroughly to educate engineers and architects. Its aim is therefore twofold—general and technical. A considerable proportion of the course of study is devoted to general and literary work, since a graduate is now expected to arrange his ideas in clear order and to write and speak effectively. Professional success depends upon this power far more than is commonly supposed.

There is an ever increasing fund of general and scientific knowledge with which every educated man is expected to be conversant, if he desires to retain the esteem of his associates and clients. A large and most valuable portion of this knowledge is still locked up in foreign languages, and these must be acquired by patient study and practice.

It might appear that this general training would be sufficient to demand the entire attention of the student during his whole course, but not less than one-half his time must be given to purely technical training and to the acquirement of a professional capital or stock of information and knowledge of details, together with extensive practice in the attack and solution of problems and difficulties.

METHODS OF INSTRUCTION

Whenever suitable text-books can be found, they are employed, because their use saves much time in acquiring facts and data, and because such books become doubly valuable for later reference when enriched by notes and additions. But to arouse most fully the enthusiasm of the student, discussions and formal lectures are necessary, and they must be fully illustrated by sketches, diagrams, drawings, and photographs of executed work. In all courses of study offered by this College, drawing, in its manifold forms and uses, is made a special feature, both in its applications and its modes of execution.

EQUIPMENT

The equipment of the various departments is described under appropriate heads. In addition to this, the College has a good reference library and some valuable apparatus of a general character. The most important portion consists of a collection of machines and apparatus for abbreviating computations, and especially for use in the calculation of tables. The principal instruments are here mentioned:

(1) A Thomas ten-place arithmometer, the largest size

manufactured, imported especially for the University, and giving products of numbers to twenty places. (2) Two Thacher's computing scales for performing multiplication, division, squaring, and extraction of square root. (3) An Amsler's polar planimeter for measuring areas of figures of any form, and employed principally in graphic statics, or in measuring indicator diagrams. (4) A Coradi's rolling planimeter and a Coradi's polar planimeter for very accurate use. (5) An Amsler's integrator for obtaining area, static moment, and moment of inertia of a plane figure, especially of sections of columns, beams, etc. (6) A Coradi's pantagraph of best construction for the reduction of drawings and maps. (7) Various computing machines, including Boucher's calculator, Ram's slide rules, duplex slide rule, Webb's adders, the ribbon adder, etc. (8) Grant's computing machines. Cox's graphical computers.

DESCRIPTION OF DEPARTMENTS

ARCHITECTURE

The department of architecture and architectural engineering occupies nearly the entire upper story of Engineering Hall, with spacious drawing rooms lighted by skylights, convenient class rooms, cabinet, museum, and studies.

EQUIPMENT

A large collection of casts of ornament is placed on the walls of the drawing rooms. Models of ceilings, roof trusses, stairs, joints in woodwork, with a large number of specimens of stone, terra cotta, molded bricks, etc., are found in the architectural museum, together with some interesting Norwegian, Indian, and Japanese art works.

A fine collection of 20,000 engravings, photographs, and photoprints, mounted on cards eleven by fourteen inches, is placed in the drawing rooms, classified according to the Dewey decimal system, for use in construction, history of architecture, and designing, and forms a most valuable working library for draftsmen and designers.

An electric arc lantern is permanently placed in a special lecture room with stepped floor. For use with it, there are 2,500 lantern slides, illustrating the history of architecture, in all countries, and especially in the United States.

The University has an excellent working library in architecture and building, and the department has a fine collection of books for use in architectural designing, placed in a room adjoining the drawing rooms.

Apparatus is provided for making tests in heating and ventilation, and for making photographs and lantern slides.

The department also possesses a large collection of working drawings, from the offices of noted architects, of residences, offices, United States buildings, and especially of the more important structures of the World's Columbian Exposition.

The course in architecture makes a specialty of architectural drawing, rendering, and design.

COURSE OF INSTRUCTION

Required for Degree of B.S. in Architecture

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4); Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1); Free-hand Drawing or Modeling (Arch. 20 or 21); French 5, or German B or 1 or 4, or English 1; Military 1, 2; Physical Training 1, 3 or 7, 9.

2. Analytical Geometry (Math. 6); Descriptive Geometry, Lettering, Sketching (Drawing, Gen. Eng'g 2); Free-hand Drawing (Arch. 20 or 21); French 5, or German 2 or 6, or English 2; Military 2; Physical Training, 1, 3.

Second Year

1. Applied Mechanics (Theo. and App. Mech. 4); Wood Construction (Arch. 2); The Orders of Architecture (Arch. 8); Physics 1, 3; Monthly Problems (Arch. 9); Rhetoric 2; Military 2.

2. Strength of Materials (Theo. and App. Mech. 5); Masonry and Metal Construction (Arch. 3); Requirements and Planning of Buildings (Arch. 15); Physics 1, 3; Monthly Problems (Arch. 9); Rhetoric 2; Military 2.

Third Year

1. History of Architecture (Arch. 6); Details of Styles (Arch. 7); Architectural Seminary (Arch. 11); Sanitary Construction (Arch. 4); Architectural Designing (Arch. 17); Chemistry 1, or Economics 1a; Monthly Problems (Arch. 9).

2. History of Architecture (Arch. 6); Details of Styles (Arch. 7); Architectural Seminary (Arch. 11); Graphic Statics and Roofs (Arch. 5); Architectural Perspective (Arch. 14); Architectural Composition (Arch. 18); Monthly Problems (Arch. 9).

Fourth Year

1. Superintendence (Arch. 12a); Estimates (Arch. 12b;) Specifications (Arch. 12c); Heating and Ventilation (Arch. 13); Renaissance Design (Arch. 22); Gothic Design (Arch. 23); Romanesque Design* (Arch. 24).

2. Working Drawings (Arch 10); Residence Design (Arch. 16); Design of Ornament (Arch. 25); Surveying (Civil Eng'g 10); Thesis.

ARCHITECTURAL ENGINEERING

This course of study prepares graduates for professional employment as architects, structural designers and computers, as well as superintendents of construction. It is intended for students who prefer the structural and mathematical side of the profession to its artistic side, and who desire to pursue the full engineering course in mathematics and to acquire a thorough knowledge of the iron and steel construction now employed in buildings. It differs from the architectural course principally in the addition of a second year of mathematics and of a year of civil engineering study in bridge analysis and design, and in devoting considerably less time to architectural drawing and designing.

*A second term in Arch. 22 will be accepted in lieu of Arch. 23 or Arch. 24.

COURSE OF INSTRUCTION

Required for Degree of B.S. in Architectural Engineering

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4) ; Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1a, 1b) ; Shop Practice (Mech. Eng'g 1, or Free-hand Drawing or Modeling (Arch. 20 or 21) ; French 5, or German B or 1 or 4, or English 1 ; Military 1, 2 ; Physical Training 1, 3 or 7.

2. Analytical Geometry (Math. 6) ; Descriptive Geometry, Lettering, Sketching (Drawing, Gen. Eng'g 2a, 2b, 2c) ; Shop Practice (Mech. Eng'g 1), or Free-hand Drawing (Arch. 20 or 21) ; French 5, or German 2 or 6, or English 2 ; Military 2 ; Physical Training 1, 3 or 7.

Second Year

1. Differential Calculus (Math. 7) ; Wood Construction (Arch. 2) ; The Orders of Architecture (Arch. 8) ; Physics 1, 3 ; Rhetoric 2 ; Military 2.

2. Integral Calculus (Math. 9) ; Masonry and Metal Construction (Arch. 3) ; Requirements and Planning of Buildings (Arch. 15) ; Physics 1, 3 ; Rhetoric 2 ; Military 2.

Third Year

1. Analytical Mechanics and Resistance of Materials (Theo. and App. Mech. 1, 2a) ; History of Architecture (Arch. 6) ; Architectural Seminary (Arch. 11) ; Sanitary Construction (Arch 4) ; Chemistry 1.

2. Resistance of Materials, Hydraulics (Theo. and App. Mech. 2b, 3) ; History of Architecture (Arch. 6) ; Architectural Seminary (Arch. 11) ; Graphic Statics and Roofs (Arch. 5) ; Chemistry 16 ; Electrical Engineering (Elect. Eng'g 1).

Fourth Year

1. Superintendence (Arch. 12a) ; Estimates (Arch. 12b) ; Specifications (Arch. 12c) ; Heating and Ventilation (Arch. 13) ; Architectural Engineering (Arch. 19) ; Bridge Analysis and Details (Civil Eng'g 12, 13).

2. Working Drawings (Arch. 10) ; Residence Design (Arch. 16) ; Bridge Details and Design (Civil Eng'g 13, 14) ; Surveying (Civil Eng'g 10) ; Thesis.

CIVIL ENGINEERING

The design in this department is to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer. While the instruction aims to be practical by giving the student information and practice directly applicable in his future professional work, the prime object is the development of the mental faculties. The power to acquire information and the ability to use it are held to be of far greater value than any amount of so-called practical knowledge.

EQUIPMENT

This department has an extensive equipment of compasses, engineers' transits, solar transits, levels,—ordinary and precise,—plane tables, sextants, chronometers, barometers, etc. For the lecture-room, the department is provided with full-size joints of an actual railroad bridge, sections of columns, eye-bars, etc., and a large collection of lithographs, photographs, and blue-prints of bridges and buildings.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Civil Engineering

First Year

1. Advanced Algebra and Trigonometry (Math. 1, 3); Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1a, 1b); Shop Practice (Mech. Eng'g 1); French 5, or German B or 1 or 4, or English 1; Military 1, 2; Physical Training 1, 3.

2. Analytical Geometry (Math. 6); Descriptive Geometry, Lettering, Sketching (Drawing, Gen. Eng'g 2a, 2b, 2c); Shop Practice (Mech. Eng'g 1); French 5, or German 2 or 6, or English 2; Military 2; Physical Training 1, 3.

Second Year

1. Differential Calculus (Math. 7); Land Surveying and Topographical Drawing (Civil Eng'g 1, 2); Physics 1, 3; Rhetoric 2; Military 2.

2. Integral Calculus (Math 9); Topographical Surveying, and Transit Surveying and Leveling (Civil Eng'g 2, 3); Physics 1, 3; Rhetoric 2; Military 2.

Third Year

1. Analytical Mechanics, and Resistance of Materials (Theo. and App. Mech. 1, 2); Railroad Engineering (Civil Eng'g 4); Chemistry 1; Steam Engines (Mech. Eng'g 16).

2. Resistance of Materials, and Hydraulics (Theo. and App. Mech. 2, 3); Graphical Statics and Roofs (Arch. 5); Road Engineering (Mun. and San. Eng'g 1); Descriptive Astronomy (Astron. 4); Steam Boilers (Mech. Eng'g 17).

Fourth Year

1. Bridge Analysis, and Bridge Details (Civil Eng'g 12, 13); Masonry Construction (Civil Eng'g 5); Water Supply Engineering (Mun. and San. Eng'g 2); Practical Astronomy (Astron. 6); Thesis.

2. Bridge Details, and Bridge Design (Civil Eng'g 13, 14); Sewerage (Mun. and San. Eng'g 3); Railroad Structures (Civil Eng'g 17); Tunneling (Civil Eng'g 15), or Geodesy (Civil Eng'g 6); Economics 2 or 8; Engineering Contracts and Specifications (Civil Eng'g 16); Thesis.

ELECTRICAL ENGINEERING

INSTRUCTION

This is a course in theoretical and applied electricity. It extends through four years. The first two years are substantially the same as in the other engineering courses. In the last two years the course includes the fundamental subjects in theoretical and applied mechanics and steam engineering, but a large part of the time is given to courses in electricity and its applications. The features of the instruction are the facilities offered for laboratory work by the student; the work done in calculating, designing, and making working drawings of electrical apparatus; the senior thesis requirements and facilities offered for original work.

EQUIPMENT

A recitation room, drafting room, seminary room, and the main office, are in Engineering Hall. The dynamo laboratory, large lecture room, special testing and thesis rooms, battery room, photometry rooms, students' shop, and instructor's office are in Mechanical and Electrical Engineering Laboratory.

The six large pier-rooms of the department of physics are used for advanced electrical and magnetic measurements. These rooms, with their equipment, are described in more detail under the equipment of the physics department. The drafting and seminary rooms are well lighted and supplied with every convenience. The seminary room is accessible to members of the senior class at all times. It contains files of the leading journals of theoretical and applied electricity in English, French, and German, besides a department reference library.

The dynamo laboratory is equipped with various types of continuous current dynamos and motors, alternators, and transformers, with apparatus and every convenience for making complete tests. Included in this equipment are a 300-light Thomson-Houston alternator, a 40-horse power Westinghouse two-phase induction motor, Brush and Thomson-Houston arc light machines, Edison, Westinghouse, and Jenney 500-volt motors, a complete electric car equipment for testing purposes, a Jenney 220-volt dynamo, Edison (two machines), Thomson-Houston, Weston, United States, and other 110-volt dynamos; also two small Westinghouse alternators, and a number of fan and battery motors.

A marble switchboard, consisting of eight large panels, has been designed with special reference to facilitating the work in the laboratory. From it can be distributed to all parts of the building alternating and continuous currents of various electromotive forces. Connection can easily be made to the various circuits of the University lighting plant, and to the storage battery. There are two large cabinets of instruments for laboratory use. Among them are Weston ammeters, voltmeters, and wattmeters, Whitney, Hoyt, and Queen ammeters, Ayrton and Perry ammeters and voltmeters, Cardew and Queen voltmeters, Siemens dynamometers, Kelvin balances, electrostatic voltmeters, Shallenberger, Thomson, and Shaeffer recording meters, hysteresis meters, electrometers, condensers, inductive and non-inductive resistances, lamp, german-silver, carbon, and water rheostats, a Brackett cradle dynamometer, tachometers, revolving contact makers, and other devices and appliances which are essential to the thorough experimental study of direct and alternating currents.

A standardizing laboratory is equipped for accurately measuring current and electromotive force, thus permitting at all times ready calibration of the instruments used in the laboratory.

An experimental telephone and signaling line has been erected, and several sets of receivers and transmitters have been provided for testing purposes.

A high potential testing transformer, with a specially designed electrically heated oven, and other accessory apparatus, facilitate disruptive tests on insulators and insulating materials.

The photometry rooms are supplied with two electric light photometers, one of which is the latest type of Kruess-Bunsen apparatus fitted with a standard Hefner lamp and various accessories. There are numerous types of incandescent lamps and of continuous and alternating arc lamps, and various conveniences for making candle power, life, and efficiency tests are provided.

The battery room contains a collection of primary cells, and over 90 cells of secondary battery, including several makes, fitted with switchboard and testing conveniences.

The work-shop, shared in common with the department of physics, is supplied with an engine-lathe, a speed lathe, a Universal milling machine, a grinder, etc., and a line of fine tools. An electric motor furnishes power for this shop. The services of an experienced mechanician enable the department to manufacture special apparatus as required.

The University electric lighting and power plant is available for tests by the department. It consists of two Westinghouse two-phase alternating current dynamos, one of 75-kilowatt and one of 45-kilowatt capacity, with four induction motors, having a combined output of 100 horse power; a 30-kilowatt 500-volt constant potential generator with six motors, and a Wood series arc light machine for lighting the grounds and Military Hall. The transformer capacity of the alternating plant is for seven hundred 16-candle power incandescent lamps. The prime motors for the plant are 100 horse power and 50 horse power Ideal steam engines, and a 50 horse power Westinghouse steam engine.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Electrical Engineering

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4); Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1a, 1b); Shop Practice (Mech. Eng'g 1); French 5, or German B or 1 or 4, or English 1; Military 1, 2; Physical Training 1, 3.

2. Analytical Geometry (Math. 6); Descriptive Geometry, Lettering, Sketching (Drawing, Gen. Eng'g 2a, 2b, 2c); Shop Practice (Mech. Eng'g 1); French 5, or German 2 or 6, or English 2; Military 2; Physical Training 1, 3.

Second Year

1. Differential Calculus (Math. 7); Elements of Machine Design (Mech. Eng'g 4); Shop Practice (Mech. Eng'g 2); Physics 1, 3; Rhetoric 2; Military 2.

2. Integral Calculus (Math. 9); Elements of Machine Design (Mech. Eng'g 4); Physics 1, 3, 10; Rhetoric 2; Military 2.

Third Year

1. Analytical Mechanics and Resistance of Materials (Theo. and Appl'd Mech. 1, 2a); Mechanism (Mech. Eng'g 5); Chemistry 1; Electrical and Magnetic Measurements (Physics 4); Steam Engines (Mech. Eng'g 16).

2. Resistance of Materials, Hydraulics (Theo. and Appl'd Mech. 2b, 3); Mechanical Engineering Laboratory (Mech. Eng'g 13); Steam Boilers (Mech. Eng'g 17); Elements of Dynamo Machinery (Elect.

Eng'g 11); Electrical and Magnetic Measurements (Physics 4); Elective: Mathematics 16, or Chemistry 3b, or Civil Engineering 10 (three semester-hours).

Fourth Year

1. Thermodynamics (Mech. Eng'g 7); Dynamo-Electric Machinery (Elect. Eng'g 2); Electrical Engineering Laboratory (Elect. Eng'g 3); Electrical Design (Elect. Eng'g 4); Photometry (Elect. Eng'g 5); Telegraphy and Telephony (Elect. Eng'g 6); Electric Wiring and Distribution (Elect. Eng'g 8); Seminary (Elect. Eng'g 10); Thesis; Elective (two semester-hours): Electrical Engineering 7.

2. Alternating Currents and Machinery (Elect. Eng'g 12); Alternating Current Laboratory (Elect Eng'g 13); Electrical Design (Elect. Eng'g 14); Transmission of Power (Elect. Eng'g 15); Electric Lighting, Central Stations (Elect. Eng'g 9); Seminary (Elect. Eng'g 10); Advanced Electrical Measurements (Physics 9); Thesis.

MECHANICAL ENGINEERING

It is the object of this course to give the student a thorough training in the theoretical principles underlying the science of machines and mechanics, and at the same time to enable him to become practically familiar with some of the numerous applications of these principles.

EQUIPMENT

The equipment of this department is arranged for work under three heads—class and drawing room work, laboratory work, and shop practice.

The *drawing rooms* are equipped with modern desks, boards, filing cabinets, card indexes, reference books, catalogues, odontographs, gear charts, tables, etc. In the cabinet rooms are kinematic models and sectioned steam specialties, many of which were donated by the manufacturers.

The *steam engineering laboratory* is in the *Mechanical and Electrical Engineering Laboratory.* It contains the lighting and power plant of the University, consisting of one 50 horse-power Ideal single-cylinder, high-speed engine, one 50 horse-power Westinghouse engine, and one 100 horse-power Ideal tandem compound engine. These engines are supplied with high pressure steam through an independent main to the boilers.

There are five other experimental steam engines, connected by independent steam main to the boilers. There are also gas engines, air compressors, a volume fan, steam pumps, a hot air engine, and numerous steam specialties arranged for experimental tests.

The laboratory contains a large assortment of the usual instruments for testing purposes. A four-ton traveling crane of 20-foot span covers the central floor space.

The boiler room of the new central heating station contains one vertical boiler, one 100 horse-power horizontal tubular boiler, equipped with Brightman mechanical stoker, one 250 horse power National water tube boiler, equipped with the Murphy furnaces, two 220 horse-power Babcock & Wilcox boilers, equipped with the Roney mechanical stokers, together with all necessary accessory apparatus, all available for testing purposes. The pumping station and power plants of the two cities furnish additional opportunities for experimental work.

Considerable apparatus designed for use on locomotive road tests has been constructed and arrangements have been made for regular tests of locomotives in actual service. The department now owns with the P. & E. Division of the C., C., C. & St. L. Ry. a fully equipped dynamometer car, No. 609. This car has been designed and built for locomotive and railway tests, and is used for no other purpose. It has sleeping accommodations for four persons. It is designed with special reference for the following service:

1. Locomotive road tests for economy.
2. Measurements of train resistance and of hauling capacity of locomotives.
3. Automatic track inspection for line and grade.
4. Airbrake service inspection.
5. Stationary plant tests at Railway Shops.

The machine shop, foundry, and forge shop are located in the Metal Shops.

The *machine shop* contains one twenty-seven-inch by twelve-foot bed F. E. Reed & Co. engine lathe; one twenty-one-inch by fourteen-foot bed Putnam Standard Engine lathe; twelve engine lathes of from twelve- to twenty-inch swing; two ten-inch speed lathes; one centering lathe; one fifteen-inch Gould & Eberhardt shaper; one fifteen-inch Hendey shaper; one No. 3 Brown & Sharpe plain milling machine; one Brainard universal milling machine; one twenty- by twenty-inch by five-foot Putnam planer; one thirty- by thirty-inch by eight-foot G. A. Gray & Co., planer; one No. 2 improved Brown & Sharpe universal grinding machine; one Brown & Sharpe cutter and reamer grinder; one No. 1 Bickford radial drill; one twenty-eight-inch drill press; one twenty-inch drill press; one sensitive drill press; one water emery tool grinder; one center grinding machine; one Stover power hack saw; one Worcester twist drill grinder; complete set of United States standard taps and dies, drills, arbors, reamers, gear and milling cutters, caliper gauges, calipers, scales, and other small tools.

The *wood shop* occupies the first floor of the Wood Shops and Testing Laboratory, and contains twenty-six improved wood-working benches, fourteen of which are fitted with Wyman and Gordon patent vises; one thirty-four-inch F H. Clement & Co. band saw; one thirty-six inch Yerkes & Finan band saw; one twenty-inch Clement & Co. band saw; one thirty-six inch Yerkes & Finan band saw; one twenty-inch Clement & Co. wood planer; one J. A. Fay & Co. jig-saw; one J. A. Fay & Co. jointer; eight ten-inch wood lathes; one eighteen-inch pattern-makers' lathe; one No. 4 E. Fox trimmer, together with a complete equipment of small tools.

The *foundry* occupies a room 48 by 48 feet in the Metal Shops, and is equipped with a twenty-four-inch Whiting patent cupola, a core oven, and the necessary sand, ladles, and flasks for making castings. A No. 7 Buffalo steel pressure fan furnishes blast for the cupola.

The *forge shop* occupies a room 36 by 48 feet in the Metal Shops, and contains ten latest improved Buffalo down-draft forges. Blast is furnished these forges by a No. 5 Sturtevant pressure blower, and all gases of combustion are exhausted under ground by means of a No. 9 Sturtevant exhaust fan.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Mechanical Engineering

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4); Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1a, 1b); French 5, or German B or 1 or 4, or English 1; Shop Practice (Mech. Eng'g 1); Military 1, 2; Physical Training 1, 3.

2. Analytical Geometry (Math. 6); Descriptive Geometry, Lettering, Sketching (Drawing, Gen. Eng'g 2a, 2b, 2c); French 5, or German 2 or 6, or English 2; Shop Practice (Mech. Eng'g 1); Military 2; Physical Training 1, 3.

Second Year

1. Differential Calculus (Math. 7); Physics 1, 3; Rhetoric 2; Elements of Machine Design (Mech. Eng'g 4); Shop Practice (Mech. Eng'g 2); Military 2.

2. Integral Calculus (Math. 9); Physics 1, 3; Rhetoric 2; Elements of Machine Design (Mech. Eng'g 4); Shop Practice (Mech. Eng'g 2); Military 2.

Third Year

1. Analytical Mechanics and Resistance of Materials (Theo. and Appl'd Mech. 1, 2a); Chemistry 1; Power Measurements (Mech. Eng'g 3); Mechanism (Mech. Eng'g 5); Steam Engines (Mech. Eng'g 16).

2. Resistance of Materials, and Hydraulics (Theo. and Appl'd Mech. 2b, 3); Chemistry 16; Power Measurements (Mech. Eng'g 3); Steam Boilers (Mech. Eng'g 17); Electrical Engineering (Elect. Eng'g 1); Surveying (Civil Eng'g 10).

Fourth Year

1. Thermodynamics (Mech. Eng'g 7); Heat Engines (Mech. Eng'g 6); High-Speed Steam Engines and Valve Gears (Mech. Eng'g

14); Advanced Designing (Mech. Eng'g 9); Advanced Mechanical Laboratory (Mech. Eng'g 12; Seminary (Mech. Eng'g 19); Thesis.

2. Mechanics of Machinery (Mech. Eng'g 8); Graphical Statics of Mechanisms (Mech. Eng'g 18); Estimates (Mech. Eng'g 10); Advanced Designing (Mech. Eng'g 9); Advanced Mechanical Laboratory (Mech. Eng'g 12); Seminary (Mech. Eng'g 19); Thesis.

RAILWAY ENGINEERING

The railroad interests of the State of Illinois, as well as of the United States, have become so important as to demand a separate recognition in the courses of those educational institutions which offer instruction in engineering.

Wishing to meet the demand for specialization along this important line the University has established an undergraduate course leading to the degree of B. S. in *Railway Engineering*, and also provides for graduate instruction and investigation in this department leading to a second degree.

Three leading railroads of the state have promised their coöperation in the work of the department. The department of civil engineering already furnishes special instruction relating to construction and maintenance of way. In this new course the purpose is to pay more attention to the problems of motive power and machinery, including construction, design and operation of locomotives and rolling stock, as well as tests of fuel, water supply, materials, and supplies.

EQUIPMENT

The shops and laboratories of the departments of mechanical and electrical engineering, applied mechanics and chemistry furnish abundant laboratory facilities along these special lines.

A dynamometer car is now owned by this department and the P. & E. Division of the C., C., C. & St. L. Ry. (see p. 87).

The department is rapidly acquiring a considerable amount of class room and laboratory material, such as photographs, blue prints and samples of manufactured specialties of value to the students of this work.

The completion of the new railway shops of the P. & E. Div. of the C., C., C. & St. L. Ry. at Urbana furnishes exceptional opportunities for inspection of construction and repair work, and the assured aid which this department will receive from the management of these shops cannot but be of considerable value to the student.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Railway Engineering

First Second and Third Years

Same as the course of instruction in mechanical engineering.

Fourth Year

1. Thermodynamics (Mech. Eng'g 7); Locomotive Engines (Ry. Eng'g 1); Locomotive Engine Design (Ry. Eng'g 2); Shop Systems (Ry. Eng'g 3); Locomotive Road Tests (Ry. Eng'g 4); Seminary (Mech. Eng'g 19); Thesis.

2. Mechanics of Machinery (Mech. Eng'g 8); Compressed Air in Railway Service (Ry. Eng'g 5); Railway Estimates (Ry. Eng'g 6); Advanced Designing (Ry. Eng'g 7); Dynamometer Car Tests (Ry. Eng'g 8); Seminary (Mech. Eng'g 19); Thesis.

MUNICIPAL AND SANITARY ENGINEERING

This course is designed for students desiring to make a specialty of city engineering work. It prepares for the varied duties of engineer of the department of public works of cities and includes instruction in modern methods of sanitation of cities.

INSTRUCTION

Instruction is given by lectures, by text-book and seminary work, and by field, laboratory, and drafting work. The methods of training are intended to develop power to take up and solve new problems connected with municipal public works, as well as to design and to superintend the ordinary constructions. Surveying, structural materials, and structural design are taught as in the civil engineering course. Chemistry, botany, and bacteriology, so far as necessary to a comprehension of the questions involved in water supply and sewage disposal, are given.

COURSE OF INSTRUCTION

Required for Degree of B.S. in Municipal and Sanitary Engineering

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4); Elements of Drafting, Descriptive Geometry (Drawing, Gen. Eng'g 1a, 1b); Shop Practice (Mech. Eng'g 1); French 5, or German B or 1 or 4, or English 1; Military 1, 2; Physical Training 1, 3.

2. Analytical Geometry (Math. 6); Descriptive Geometry, Lettering and Sketching (Drawing, Gen. Eng'g 2a, 2b, 2c); French 5, or German B or 2 or 6, or English 2; Military 2; Physical Training, 1, 3.

Second Year

1. Differential Calculus (Math. 7); Land Surveying and Topographical Drawing (Civil Eng'g 1, 2); Physics 1, 3; Rhetoric 2; Military 2.

2. Drawing and Surveying (Civil Eng'g 2, 3); Integral Calculus (Math. 9); Physics 1, 3; Rhetoric 2; Military 2.

Third Year

1. Analytical Mechanics, and Resistance of Materials (Theo. and Appl'd Mechanics 1, 2a); Physics Bacteriology (Mun. and San. Eng'g 5a); Chemistry 1a; Railroad Engineering (Civil Eng'g 4a); Steam Engines (Mech. Eng'g 16).

2. Resistance of Materials, and Hydraulics (Theo. and Appl'd Mech. 2b, 3); Road Engineering (Mun. and San. Eng'g 1); Graphic Statics and Roofs (Arch. 5); Chemistry 3a; Steam Boilers (Mech. Eng'g 17); Electrical Engineering 1.

Fourth Year

1. Bridges (Civil Eng'g 12, 13); Chemistry 20; Masonry Construction (Civil Eng'g 5); Water Supply Engineering (Mun. and San. Eng'g 2); Thesis.

2. Bridge Design (Civil Eng'g 13, 14a); Engineering Contracts and Specifications (Civil Eng'g 16); Mechanical Engineering Lab-

oratory (Mech. Eng'g 13); Sewerage (Mun. and San. Eng'g 3); Water Purification, Sewage Disposal, and General Sanitation (Mun. and San. Eng'g 6); Thesis.

PHYSICS

The courses in this department are designed to furnish the student who intends to follow the profession of engineering, science teaching, or research in physical science, with a knowledge of the phenomena and laws of physics.

EQUIPMENT

The rooms devoted to physics are in Engineering Hall. They include a large lecture room and cabinet, a large general laboratory and cabinet, several small laboratories, a constant-temperature room, a battery room, a workshop, and several private studies, laboratories, and offices.

The *lecture room* is in the form of an amphitheater, and is furnished with opera chairs provided with tablet arms. Piers at the lecture desk and in the center of the room make demonstrations with the more delicate apparatus possible. A permanent screen and rolling blinds operated by a motor facilitate illustration by lantern. The cabinet rooms adjoining the lecture room are supplied with apparatus suitable for illustration and demonstration, and are provided with conveniences for preparing apparatus for lectures.

The general laboratory is a room sixty feet square and is well lighted and ventilated. It is supplied with tables, shelves, and sinks, arranged for general experimental work. The cabinet room adjoining this laboratory contains the apparatus designed for elementary experimental work.

The *small laboratories,* six in number, are on the first floor, and are abundantly provided with masonry piers, wall shelves, sinks, dark curtains, etc. These rooms are now equipped with apparatus for electrical measurements. They contain a line of high-grade apparatus for advanced experimental work and research.

The *constant-temperature* room is on the first floor. It is isolated from the surrounding space by double masonry walls and double doors. It is arranged for such experiments as require a low, uniform temperature.

The department shares a workship with the department of electrical engineering (see p. 85). This gives the department facilities for preparing special apparatus of use in advanced and original investigations.

In addition to the preceding, there are a number of private studies and laboratories for the use of advanced students and instructors.

THEORETICAL AND APPLIED MECHANICS

The courses in theoretical and applied mechanics are designed to meet the needs of students of the College of Engineering.

EQUIPMENT

The laboratory of applied mechanics is located in the Wood Shops and Testing Laboratory. It comprises the *materials laboratory* and the *hydraulic laboratory.*

The *materials laboratory* has an Olsen testing machine of 200,000 pounds' capacity, arranged to test beams twenty feet long; a Riehle testing machine of 100,000 pounds' capacity; apparatus for testing beams; Keep's dead-load and impact machines for cast iron; a Riehle wire-testing machine, extensometers and deflectometers, a stone-grinding machine, four rattlers for abrasion tests of stone and brick, with other apparatus for making all necessary measurements and observations, etc. The laboratory is fitted up as a working laboratory, where students may acquire such practice in experimental work as engineers are called upon to perform, as well as for the purpose of illustrating principles, and also for use in original investigation.

The *hydraulic laboratory* contains a steel standpipe connected with city water supply and having several openings, a steam pump, centrifugal pump, tanks, pits, scales, pressure gauges, hook gauges, meters, including a Venturi meter, water motor and other apparatus for experiments with orifices, tubes, weirs, pipes, hose, and nozzles. Experiments are made in connection with the regular class instruction.

COLLEGE OF SCIENCE

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT.
STEPHEN A. FORBES, PH.D., DEAN, Zoölogy.
THOMAS J. BURRILL, PH.D., LL.D., Botany and Horticulture.
SAMUEL W. SHATTUCK, C.E., Mathematics.
CHARLES W. ROLFE, M.S., Geology.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Art and Design.
SAMUEL W. PARR, M.S., Applied Chemistry.
DAVID KINLEY, PH.D., Economics.
ARNOLD TOMPKINS, PH.D., Pedagogy.
ALBERT P. CARMAN, SC.D., Physics.
GEORGE T. KEMP, M.D., PH.D., Human Physiology and Vertebrate Anatomy.
GEORGE W. MYERS, PH.D., Astronomy and Mathematics.
EVARTS B. GREENE, PH.D., History.
JACOB K. SHELL, M.D., Physical Training.
EDGAR J TOWNSEND, PH.M., Mathematics. [On leave.]
VIOLET D. JAYNE, A.M., English.
HARRY S. GRINDLEY, SC.D., Chemistry.
T. ARKLE CLARK, B. L., Rhetoric.
HERMAN S PIATT, PH.D., French.
ARTHUR H. DANIELS, PH.D., Philosophy.
CHARLES W. TOOKE, A.M., Public Law and Administration.
FRED A. SAGER, B.S., Physics.
FRANK SMITH, A.M., SECRETARY, Zoölogy.
JOHN E. McGILVREY, A.B., Pedagogy.
CHARLES A. KOFOID, PH.D., Zoölogy.

OSCAR QUICK, A.M., Physics.
JOHN P. HYLAN, PH.D., Psychology.
JENNETTE E. CARPENTER, O.M., Physical Training for Women.
GEORGE A HUFF, JR., Coach of Athletic Teams.
CARLTON R. ROSE, PH.M., Chemistry.
AGNES S. COOK, A.B., Rhetoric.
GEORGE H. MEYER, A.M., German.
WILLIAM C. BRENKE, B.S., Mathematics.
CHARLES T. WILDER, B.S., Photography.
MATTHEW B. HAMMOND, PH.D., Economics and Sociology.
HENRY L. SCHOOLCRAFT, A.M., History.
NEIL C. BROOKS, PH.D., German.
MARTHA J. KYLE, A.B., Rhetoric.
HENRY L. COAR, A.B., Mathematics.
CLENDON V. MILLAR, M.S., Chemistry.
GEORGE P. CLINTON, M.S., Botany.
GEORGE D. HUBBARD, M.S., Geology.
HUBERT V. CARPENTER, B.S., Physics.
JOHN L. SAMMIS, B.S., Chemistry.
ROBERT W. STARK, B.S., Chemistry.
ALBERT P. SY, B.S., Chemistry.
CHARLES W. YOUNG, B.S., Botany.
STANLEY M. LEWIS, Free-Hand Drawing.
SARAH L. DEWEY, B.S., Fellow, Physiology.
HARRY C. COFFEEN, B.S., Fellow, Mathematics and Astronomy.
ALEXANDER D. DUBOIS, Military Science.

AIMS AND SCOPE

The College of Science is based upon the idea that the methods of science and the branches of study to which those methods are applicable present a subject-matter and a discipline ample for the purposes of a liberal education, and that an education so derived differs materially in character and value from one whose sources are mainly literary. This College is distinguished in general from the technical colleges of the University by the fact that its choice of subjects is not limited by practical ends, and from the College of Literature and Arts by the predominance, in its courses and requirements, of the strictly scientific subjects. It is articulated with the latter, however, by the liberal elections from the literary courses permitted to students who have satisfied its demands as to scientific work, and by the special courses in science open to election by students from the companion college.

It affords an opportunity for the study of the natural, physical, mathematical, and mental sciences, and of economic, sociological, and philosophical subjects, either as specialties or as the substance of a general education. The candidate for graduation may take a year each in any four of the principal subjects of this College, with a considerable amount of language, literature, and general study; he may concentrate his major work on any one of the several subjects in which major courses are offered; or he may adopt any program of concentration of his major work intermediate between these extremes. The subjects presented in this College are accordingly arranged in four groups,—chemical and physical, mathematical, natural science, and philosophical,—each characterized by the predominant importance and development of the subjects indicated by its name. The studies of each group are again divided into required and elective subjects, and the latter are further subdivided into two lists, A and B. All the required subjects are necessary to graduation in the group of studies specified; those of the elective lists A and B are open to election, restricted only by certain general requirements, varying in the different groups, regarding the amount and distribution of the work to be done on them.

It is the purpose of this system of classification and requirement to permit large liberty of choice with respect both to main lines of study and to associated or secondary subjects, and at the same time so to guide the student's elections that his course of study shall always contain a central core or axis of closely articulated major work. Preference is further given by this means to those minor subjects most important because of their relations to the major work elected.

The only degree given in this College is that of bachelor of science. University credit to the amount of one hundred and thirty hours* is required for graduation. Ten of these may be earned by investigation work, the results of which are to be presented in a final thesis. Credit will be given for fractions of courses of instruction in exceptional cases only, by vote of the college faculty.

The attention of women students is especially called to the courses outlined under "household economics," p. 165. These courses count for credit for students in either the chemical or the natural science group.

EQUIPMENT

Laboratories.—The College of Science occupies three of the University buildings—the Chemical Laboratory, Natural History Hall, and the Astronomical Observatory—together with several rooms in University Hall assigned to the mathematical department and to some of the departments of the philosophical group. The physics laboratories and lecture room are in Engineering Hall, and the natural history museum is in University Hall.

The laboratory and library facilities of this College have been acquired with primary reference to the needs of the undergraduate student, and are scarcely surpassed, for their purpose, in grade and completeness, among American universities. The graduate student likewise finds here an ample equipment, material, and opportunity for independent investigation in several departments of study, notably in those covered by the operations of the State Laboratory of Natural History and of the State Entomologist's office.

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*For definition of "hours" see p.167.

THE CHEMICAL AND PHYSICAL GROUP

AIMS

The purposes of the chemical and physical group are:

1. To provide a training in the principles of chemistry and physics as part of a liberal education.

2. To furnish such instruction and training in these sciences as is requisite for the successful prosecution of studies in other sciences, i. e., biology, physiology, geology, agriculture, sanitary engineering, electrical engineering, domestic economy, etc.

3. To afford opportunity for the acquisition of the technical knowledge and skill needed in the applications of chemistry in the industrial world by the analytical chemist and expert, the manager of chemical and metallurgical industries, or the scientific and manufacturing pharmacist.

4. To meet the demands of those who are preparing themselves as teachers of chemistry and physics.

5. To lay the foundation for a career as investigator in chemistry or in physics.

Suggestions as to choice of courses.—The courses in chemistry and in physics, which are outlined on pages 103 and 107, include lists of electives which afford opportunities for extensive range in selection of options, so that it is possible to arrange numerous combination courses directed to various specific ends.

One intending to teach chemistry and physics should take all the prescribed work of the chemical course, selecting numbers 7 and 12 among his chemical electives and taking also physics 5 or 6 and mathematics 4; he can then fill out the rest of his restricted and open electives by choice of studies from the natural science group or make choice of subjects in languages and literature, etc.; or, if he wish to devote himself more fully to physics, he should take the chemical-physical course as outlined on page 108.

A course preparatory to the study of medicine may be arranged by taking the prescribed work of the chemical course, amounting to 81 hours' credit, selecting among the chemical electives toxicology, urinalysis, and sanitary analysis, and for the other electives taking art and design, bacteriology (botany 5), biology 1, physiology 4, psychology 2, zoölogy 2 and 3. The completion of this course will enable the student to obtain credits amounting to one year's work upon the four years' medical course at the School of Medicine of the University of Illinois, and will prepare him for specialization in medical and physiological chemistry.

Students of chemistry who intend to become commercial analysts should include among their chemical electives 5c, 8, 10, 6b, 15a, b, c, 18a, 24, 25, take bacteriology (botany 5 or 6), mineralogy 1a, and fill out the rest of their electives by selection of subjects from the natural science group.

EQUIPMENT FOR CHEMISTRY

Laboratories.—The Chemical Laboratory is 75 by 120 feet and three stories high, including basement. The basement contains the water survey laboratory and rooms for storage and dispensing, and for work in assaying and metallurgical chemistry. The first floor has a lecture room and laboratory for general chemistry and qualitative analysis, each of which accommodates 150 students; a large private laboratory, and a store room. The second floor has a laboratory for quantitative analysis, and organic chemistry, a balance and reading room, and a large private laboratory.

Several recitation rooms used by this department, and rooms for special work in physical chemistry are in University Hall.

Apparatus.—The laboratories are furnished with all of the supplies required for the various lines of work in pure and applied chemistry.

The apparatus for general use, all of which is new and of the most improved pattern and construction, includes thirty-two high grade analytical Sartorius and Troemner balances, an abundant supply of platinum ware, including combustion tubes and a large retort for making pure hydrofluoric acid, Kahlbaum's mercurial air pumps, Schmidt and Haensch saccharimeters of three different styles, complete sets of Hofmann's and Lepsius's apparatus for lecture demonstrations, Orsat's and Hempel's apparatus for gas analysis, microscopes, spectroscopes, apparatus for electrolytic analysis, etc.; for work in physical chemistry there are thermostats, Abbe's and Pulfrich's refractometers, Krüss's universal spectral apparatus with all attachments, two calorimetric bombs, one of which is lined with platinum, Beckmann's apparatus, Dumas', Hofmann's, and Meyer's vapor density apparatus, apparatus for determination of electrical conductivities. The laboratory is provided with its own dynamo, a large storage battery, and an excellent projection lantern.

A very important feature of the equipment consists of the chemical library, which, in addition to all the modern, standard chemical texts, dictionaries, and encyclopedias, includes complete sets of nearly all the more important chemical journals, especially the German and the English. The current numbers of many others are regularly received.

EQUIPMENT FOR PHYSICS

For the equipment in physics see p. 94.

CHEMICAL COURSES

CLASSIFICATION OF SUBJECTS

Prescribed

1. *Chemical.*—General Elementary Chemistry (Chem. 1); 5 hours.*
   Descriptive Inorganic Chemistry (Chem. 2a); 3 hours.
   Inorganic Preparations (Chem. 2b); 3 hours.
   Organic Chemistry (Chem. 9, 9a, 14); 7½ hours.
   Qualitative Analysis (Chem. 3a); 5 hours.
   Quantitative Analysis (Chem. 5a); 5 hours.
   Seminary (Chem. 19); 4 hours.
2. *General.*—Advanced Algebra and Trigonometry (Math. 1, 3, or 2, 4); 5 hours.

*For explanation of "hours" see p. 167.

German B or 1, 3, 4, 6; 20 hours.
Military Science 1, 2; 5 hours.
Physical Training—
  Men, 1, 3; 2½ hours.
  Women, 7, 9; 3 hours.
Physics 1, 3; 10 hours.
Rhetoric 2; 6 hours.

Elective

First Semester—
Assaying (Chem. 15b); 2 hours.
Metallurgical Chemistry (Chem. 15a); 3 hours.
Sanitary Analysis (Chem. 10); 3 to 5 hours.

Second Semester—
Chemical Technology (Chem. 6a); 3 hours.
Electrolytic Analysis (Chem. 15c); 3 hours.
Food Analysis (Chem. 5c); 2 to 10 hours.
Household Chemistry (Chem. 23); 5 hours.
Industrial Chemistry (Chem. 17); 3 hours.
Iron and Steel Analysis (Chem. 8); 5 hours.
Mineral Analysis (Chem. 5b); 3 to 10 hours.
Metallurgy (Chem. 6b); 3 hours.
Theoretical Chemistry (Chem. 12); 3 hours.

Either Semester—
Agricultural Chemistry (Chem. 13); 5 or 10 hours.
Proximate Organic Analysis (Chem. 21); 3 to 10 hours.
Physical Chemistry (Chem. 7); 3 to 10 hours.
Special Advanced Courses (Chem. 18a, b, c); 1 to 10 hours.
Thesis Investigation (Chem. 11); 5 to 15 hours.
Toxicology (Chem. 24); 2 to 5 hours.
Urinalysis (Chem. 25); 2 hours.

REQUIREMENTS FOR GRADUATION

In order to graduate in chemistry, the candidate must complete all the required courses (81 hours), and must have at least 13 hours additional for subjects chosen from the list of chemistry electives. For the remaining 36 hours he must choose 18 hours of chemical electives and for the other 18 hours must choose subjects from any University offerings, subject to the approval of the head of the department of chemistry. He must make in all 130 hours' credit, and present an acceptable thesis.

Special exceptions as to the required number of chemical options may be made for those who desire to prepare themselves as teachers of chemistry rather than as technical chemists, and for those who in preparing for the study of medicine wish to take major work in chemistry.

COURSE OF INSTRUCTION

For the Degree of B.S. in Chemistry

First Year

1. General Elementary Chemistry (Chem 1); German B or 1 or 4; Mathematics 1, 3 or 2, 4; Military 1, 2; Physical Training 1, 3 or 7, 9.

2. Descriptive Inorganic Chemistry (Chem. 2a); German B or 3 or 6; Inorganic Preparations (Chem. 2b); Qualitative Analysis (Chem 3a); Military 2; Physical Training 1, 3 or 7.

Second Year

1. German 4; Physics 1, 3; Quantitative Analysis (Chem. 5a); Rhetoric 2; Military 2.

2. German 6; Organic Chemistry (Chem. 9 and 9a); Physics 1, 3; Rhetoric 2; Military 2.

Third Year

1. Organic Chemistry, special chapters (Chem. 14); Rhetoric 2; Seminary (Chem. 19); Electives.

2. Rhetoric 2; Seminary (Chem. 19); Electives.

Fourth Year

1. Seminary (Chem. 19); Electives.
2. Seminary (Chem. 19); Electives.

APPLIED CHEMISTRY AND ENGINEERING

To meet the needs of those who wish to fit themselves for such work as devolves upon the managers of establishments in which the operations depend upon chemical processes, a four years' course in chemistry with related engineering subjects has been arranged.

REQUIREMENTS FOR GRADUATION

The requirements for graduation, as indicated on pages 104 and 105, are modified as follows: The electives to be chosen from the list must include chemistry 6a and 6b, 8, and 15 (a); general engineering drawing 1, two subjects listed under mathematics, four under mechanical engineering, and two under mechanics, theoretical and applied.

A thesis is required, and completion of the work leads to the degree of bachelor of science in chemistry and engineering.

COURSE OF INSTRUCTION BY YEARS AND SEMESTERS

The prescribed and chemical electives, together with the engineering subjects necessary to meet the above conditions, are indicated below.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Chemistry and Engineering

First Year

1. Drawing (Gen. Eng'g 1a, 1b); General Chemistry (Chem. 1); German B or 1 or 4; Mathematics 1, 3 or 2, 4; Military 1, 2; Physical Training 1, 3 or 7, 9.

2. Analytical Geometry (Math. 6); Descriptive Inorganic Chemistry (Chem. 2); Qualitative Analysis (Chem 3a); German B or 3 or 6; Military 2; Physical Training 1, 3 or 7.

Second Year

1. Differential Calculus (Math. 7); German 4; Physics 1, 3; Quantitative Analysis (Chem. 5a); Rhetoric 2; Shop Practice (Mech. Eng'g 1); Military 2.

2. Chemical Technology (Chem. 6); Integral Calculus (Math. 9); German 6; Iron and Steel Analysis (Chem. 8); Physics 1, 3; Rhetoric 2; Shop Practice (Mech. Eng'g 1); Military 2.

Third Year

1. Analytical Mechanics (Theo. and Appl'd Mech. 1 or 4); Metallurgical Chemistry and Assaying (Chem. 15a); Metallurgy (Chem. 6b); Seminary (Chem. 19); Shop Practice (Mech. Eng'g 2); Steam Engines (Mech. Eng'g 16).

2. Electrical Engineering. 1; Electro Chemistry (Chem. 15b); Organic Chemistry (Chem. 9); Resistance of Materials (Theo. and Appl'd Mech. 2 or 5); Seminary (Chem. 19); Steam Boilers (Mech. Eng'g 17); Shop Practice (Mech. Eng'g 2).

Fourth Year

1. Chemistry, special advanced subjects (selected from Chemistry 12, 15a, 17, 18, 19); Steam Engines (Mech. Eng'g 16); Thermodynamics (Mech. Eng'g 7); Thesis and Investigation (Chem. 11).

2. Chemistry, special subjects (selected from Chem. 15b, 18 (a) (d), 19; Steam Boilers (Mech. Eng'g 17); Thesis and Investigation (Chem. 11).

PHYSICAL COURSES

CLASSIFICATION OF SUBJECTS

Prescribed

Chemistry 1, 2; 8 hours.*
French 1, 2, 5; or German B or 1, 3, 6; 20 hours.
Mathematics 2 (Advanced Algebra); 3 hours.
Mathematics 4 (Trigonometry); 2 hours.
Mathematics 6 (Analytical Geometry); 5 hours.
Mathematics 7 (Differential Calculus); 5 hours.
Mathematics 9 (Integral Calculus); 5 hours.
Military 1, 2; 5 hours.
Physical Training—
  Men, 1, 3; 2½ hours.
  Women, 7, 9; 3 hours.
Physics 1, 3; 10 hours.
Rhetoric 2; 6 hours.

Elective

List A (Physical)

Physics 5 and 6; 12 or 16 hours.
Physics 7; 6 or 10 hours.
Physics 8; 6 hours.
Mathematics 10 (Theory of Equations); 3 hours.
Mathematics 16 (Differential Equations); 3 hours.
Astronomy 4, 5; 5 to 10 hours.

*For explanation of "hours" see p. 167.

List B (Chemical-Physical)

Physics 5 and 6; 12 or 16 hours.
Physics 7; 6 or 10 hours.
Chemistry 3a; 5 hours.
Chemistry 9, 9a; 5 hours.
Chemistry 5a; 5 hours.
Chemistry 5b; 3 or 5 hours.
Chemistry 12; 3 hours.
Chemistry 7; 5 to 15 hours.

REQUIREMENTS FOR GRADUATION

The foregoing courses have been arranged for those who wish to prepare themselves for special work in physics and allied sciences. In addition to the subjects of the prescribed list, two general lines of work are offered under elective lists A and B, one of which must be taken with the list of prescribed subjects. The advanced theoretical work of the first of these lines is largely general mechanical physics; that of the second more especially chemical. The laboratory work follows the same lines. The additional studies necessary to complete the number of hours required for graduation may be elected from the various University courses, with the approval of the head of the department of physics.

COURSE OF INSTRUCTION

For the Degree of B.S. in Physics

First Year

1. Advanced Algebra and Trigonometry (Math. 2, 4); German B or 1 or 4; Chemistry 1; Rhetoric 2; Military 1, 2; Physical Training 1, 3 or 7, 9.

2. Analytical Geometry (Math. 6); German B or 3 or 6; Chemistry 2, 4; Chemistry 3a, or Rhetoric 2; Military 2; Physical Training, 1, 3 or 7.

Second Year

1. Physics 1, 3; Differential Calculus (Math. 7); Rhetoric 2; German 4, or Chemistry 5a; Military 2.

2. Physics 1, 3; Integral Calculus (Math. 9); Rhetoric 2; German 6, or Chemistry 5b; Chemistry 12; Military 2.

Third Year

Physics 5, 6; Mathematics 10, 16; Astronomy 4, or Chemistry 7; Electives.

Fourth Year

Physics 7, or Physics 7, 8; Electives.

It will generally be necessary to follow the above, but other arrangements consistent with sequences of courses may be made in special cases.

DESCRIPTION OF DEPARTMENTS

CHEMISTRY

The chemical offerings include courses of instruction in general elementary, inorganic, organic, physical, and theoretical chemistry, and several lines of qualitative and quantitative analysis. [See *Chemistry,* in DESCRIPTION OF COURSES, p. 183.]

The first year is devoted to the consideration of general descriptive inorganic chemistry and qualitative analysis, the first half of the second year is occupied with courses in quantitative analysis both gravimetric and volumetric, and the second half year is given to general organic chemistry. The work of these two years and that of the first half of the third year, which is devoted to more advanced organic chemistry, is prescribed for all students of the chemical courses, and is intended to impart a knowledge of the facts of chemistry, to develop skill and accuracy in manipulation, and to constitute a scientific grounding in the fundamental principles and laws of chemistry.

Aside from this prescribed work there are offered numerous electives in chemistry, which, by judicious selection, afford opportunity for specialization along any of the lines of analytical, pharmaceutical, technological, or pure chemistry.

In order that an acquaintance with chemical literature may be had, and to keep pace with the advances in chemistry, students of the third and fourth years are required to take part in the chemical seminary, in which the work consists chiefly of reviews and discussions of assigned articles in current numbers of the various journals.

One or two semesters' work in the fourth year must be devoted to the investigation of some chemical problem. This practice furnishes an opportunity to specialize along some chosen line and serves as an introduction to the methods of chemical research.

To students who are preparing to become teachers of physical science opportunity is offered for the acquirement of some experience in supervising laboratory practice in elementary chemistry. The work includes criticism and discussion of methods and application of pedagogical principles and is conducted with the coöperation of the department of pedagogy.

APPLIED CHEMISTRY

In this department there are offered ten separate courses in technological subjects. These require as preliminary work the seven general and analytical courses. They may be further supplemented by special advanced work along some chosen line. Frequent visits are made to metallurgical and other works employing chemical processes.

PHYSICS

The department of physics offers a lecture course in general descriptive physics with class room experiments, extending through the year, and accompanied by an introductory laboratory course in physical measurements. This is followed by two courses, one experimental and the other theoretical. In the experimental course the student is trained in the most exact methods of making the fundamental physical measurements and taught how to discuss his results. The theoretical course running parallel to this discusses, with the aid of elementary calculus, the theory of some of the main subjects of physics. In the senior year the student is supposed to take up some special problem for investigation and to center his laboratory work about that. An advanced mathematical course is also offered for those who wish to follow the most advanced theories and results of the science.

THE MATHEMATICAL GROUP

AIMS

The mathematical group aims to lay the mathematical foundation for special work in any one of three lines, as well as to offer an opportunity for advanced work. It is hoped that the courses offered will meet the requirements of those who need mathematics as a tool as well as of those who wish to make it a specialty.

Parallel to the pure mathematics two lines of associated work in applied mathematics are offered, namely, in physics and astronomy. Either of these may be taken by the student wishing to graduate from this group. The one leads through the physics of the sophomore year to the mathematical theory of electricity and magnetism, heat, light, and sound; the other through surveying to celestial mechanics and general and mathematical astronomy. In addition to these, a course in astronomy and physics is offered, including the mathematics through the junior year, but leading to theoretical astronomy and advanced physics in the senior year.

CLASSIFICATION OF SUBJECTS

PRESCRIBED

General Engineering Drawing 1a, 1b; 5 hours.*
Mathematics 6, 7, 9, 10, 11, 14, 16, 17; 31½ hours.
Military Science 1, 2; 5 hours.
Physical Training—
  Men, 1, 3; 2½ hours.
  Women, 7, 9; 3 hours.
Rhetoric 2; 6 hours.

ELECTIVE

List A (Mathematics and Astronomy)

Mathematics 13, 23 or 12, 18, 24; 6 or 8 hours.
Mathematics 20, 21, 22, or Astronomy 9; 6 hours.
Mathematics 15, or Astronomy 10; 2 hours.

*For explanation of "hours" see p. 167.

Astronomy 4, 5, 6; 10 hours.
Physics 1,3; 10 hours.
Civil Engineering 10; 2 hours.
French 1, 2, 5; or German B or 1, 3, 4, 6; 20 hours.

List B (Mathematics and Physics)

Mathematics 13, 23, or Mathematics 12, 18, 24; 8 or 6 hours.
Mathematics 15; 2 hours.
Physics 1, 3, 5, 6; 20 hours.
French 1, 2, 5; or German B or 1, 3, 4, 6; 20 hours.

List C (Astronomy and Physics)

Astronomy 7, 9, or Mathematics 20, 21, 22; 6 hours.
Astronomy 4, 5, 6; 6 hours.
Astronomy 10; 4 hours.
Physics 1,3, 5, 6; 15 hours.
Civil Engineering 10; 3 hours.
German B or 1, 3, 4, 6; 20 hours.

List D

Anthropology 1; 3 hours.
Biology 1; 5 hours.
Botany 1, 2; 5 or 10 hours.
Chemistry 1, 3a or 3b, 4; 5 or 10 hours.
Economics 1 or 2 to 8, 11 to 17; 2 to 34 hours.
English 1, 2; 10 hours.
French 1, 5, 2; or German B or 1, 3, 4, 6; 20 hours.
Geology 1, 3; 5 to 15 hours.
History 1, 2; 2 to 10 hours.
Latin 1; 10 hours.
Library 12; 1 hour.
Mineralogy 1, 2; 5 or 10 hours.
Pedagogy 1 to 4; 5 to 20 hours.
Philosophy 1 to 8; 2 to 24 hours.
Physiology 4 or 1; 5 or 10 hours.
Psychology 1 to 5; 3 to 24 hours.
Public Law and Administration 1 to 7; 2 to 29 hours.
Theoretical and Applied Mechanics 1; 5 hours.
Zoölogy 1, 2, 7; 5 to 15 hours.

REQUIREMENTS FOR GRADUATION

To graduate as a bachelor of science in the mathematical group, it is necessary for the student to complete the list of prescribed subjects, together with those of any one of lists A, B, or C of electives, and to present an acceptable thesis. The necessary number of 130 hours may then be made up by election from lists A, B, C, and D.

COURSES OF INSTRUCTION BY YEARS AND SEMESTERS

The studies of the mathematical group may best be taken according to the following outlines of courses in mathematics and physics, in mathematics and astronomy, and in astronomy and physics, respectively.

COURSE OF INSTRUCTION

For the Degree of B.S. in Mathematics and Physics

First Year

1. Plane and Spherical Trigonometry (Math. 3); advanced Algebra (Math. 1); Engineering Drawing 1a, 1b; French 1 or 5, or German B or 1 or 4; Military 1, 2; Physical Training 1, 3 or 7, 9; Rhetoric 2.

2. Analytical Geometry (Math. 6); French 1 or 5, or German B or 3 or 6; Military 2; Physical Training 1, 3 or 7; Rhetoric 2; Electives.

Second Year

1. Differential Calculus (Math. 7); Physics 1, 3; French 2 or German 4; Military 2.

2. Integral Calculus (Math. 9); French 2 or German 6; Military 2; Physics 1, 3.

Third Year

1. Theory of Equations (Math. 10); Theory of Determinants (Math. 11); Least Squares (Math. 14); Calculus of Variations (Math. 20); Physics 5; Electives.

2. Geometry of Space (Math. 17); Differential Equations (Math. 16); Physics 5; Electives.

Fourth Year

1. Modern Geometry (Math. 23) or Invariants (Math 12), or Theory of Functions (Math. 13); Theory of Potential and Spherical Harmonics (Math. 21, 22); Physics 6; Mathematical Seminary and Thesis (Math. 15); Electives.

2. Higher Plane Curves (Math. 18) or Algebraic Surfaces (Math. 24) or Theory of Functions (Math. 13); Physics 6; Mathematical Seminary and Thesis (Math. 15); Electives.

COURSES OF INSTRUCTION

For the Degree of B.S. in Mathematics and Astronomy

The freshman and sophomore years are the same as in the preceding scheme except that surveying (C. E. 10) is required the first year and that astronomy 4 takes the place of physics 1, 3, of the second semester, second year.

Third Year

1. Theory of Equations (Math. 10); Theory of Determinants (Math. 11); Least Squares, (Math. 14); Calculus of Variations (Ast. 11); Astronomy 5; Electives.

2. Differential Equations (Math. 16); Astronomy 6; Geometry of Space (Math. 17); Electives.

Fourth Year*

1. Theory of Functions (Math. 13); Astronomy 7; Astronomy 10 or Math. 15; Electives.

2. Theory of Functions (Math. 13); Astronomy 9; Astronomy 10 or Math. 15; Electives.

COURSES OF INSTRUCTION

For the Degree of B.S. in Astronomy and Physics

Freshman and sophomore years same as before excepting that astronomy 4 is required in the sophomore year.

Third Year

1. Astronomy 5; Least Squares (Math 14); Theory of Equations (Math. 10); Theory of Determinants (Math. 11); Calculus of Variations (Math. 20).

2. Astronomy 6; Differential Equations (Math. 16); Geometry of Space (Math. 17); Electives.

Fourth Year*

1. Astronomy 7; Physics 5, 6; Electives.

2. Astronomy 9; Physics 5, 6; Electives.

*Astronomy 12 and 13 will be given in 1899-1900.

DESCRIPTION OF DEPARTMENTS

ASTRONOMY

The instruction given in astronomy is planned to meet the needs of four distinct classes of students, viz.: (a) those who do not wish to take the time necessary to become thoroughly familiar with the facts, principles, and methods of the science, but who desire a general acquaintance with its present state and some idea of how this state has been reached; (b) engineers whose work necessitates a practical knowledge of some parts of it; (c) those students of the College of Science who wish to specialize in the geological and biological sciences, and who require a more intimate acquaintance with astronomy than can be got in one term's work; (d) those students who wish to make astronomy their specialty.

In the first courses of instruction the work of the laboratory is subordinated to that of the recitation room, but as soon as the general notions of the science become fixed in his mind, the student is required to take data and solve practical problems in the Observatory. After the student has been given sufficient practice to enable him to comprehend and appreciate the more advanced subjects of theoretical astronomy, an opportunity is provided him to familiarize himself with these subjects by the lectures and work of the senior year.

For students of class (a) course 4, presupposing mathematics through trigonometry only, is offered; for the second, courses 4 and 6, requiring the same preliminary mathematics and a term's experience in practical work with instruments, is given; for the third, courses 4, 5, and 6, extending through four terms and requiring the same mathematical preparation as course 4; and for the fourth class, all astronomical courses from 4 to 13, inclusive, are offered. Courses 7 and 9 are to be given in alternate years with 12 and 13. The courses in astronomy 7, 9, and 10, as also 12 and 13, count either as graduate or as undergraduate work, but neither set can count for both. The subjects treated in the astronomical seminary will be related to those considered in courses astronomy 7 and 9, and 12 and 13 respectively.

EQUIPMENT

The equipment of the astronomical department consists of a students' astronomical observatory, containing the following instruments:

An equatorial telescope of 12 inches aperture, the optical parts of which are by Brashear. The instrument was built and mounted by Warner & Swasey. It is provided with graduated circles, driving clock, filar micrometer, a complete set of positive and negative eyepieces, and a dial for setting in right ascension. The construction of the telescope is such that spectroscopic, or photographic, apparatus may be attached without further work on the mechanician's part; a new 4-inch equatorial by Saegmüller with graduated circles, driving clock, and eyepieces, and an old 4-inch equatorial by Newton & Co., to be used in photometric eye estimates; a combined transit and zenith telescope by Warner & Swasey, with the usual micrometer and a number of smaller instruments, such as chronometers, a Riefler clock, a polarizing photometer, an altazimuth, two chronographs, an Eastman personal equation machine, two sextants with mercurial horizons, two small astronomical transits, one of 21 inches focal length and $1\frac{7}{8}$ inches aperture, by Saegmüller, and one of 24 inches focal length and 2 inches aperture, by Newton & Co.; a Green's barometer and thermometer, a mier mark, and half a dozen masonry piers for portable instruments for the use of students in practical astronomy. A master clock for the electrical control of secondary clocks in the various buildings on the campus is mounted in the clock room of the Observatory.

MATHEMATICS

The courses offered in pure mathematics are so arranged as to meet the needs (a) of those who desire such mathematical knowledge as is necessary to carry on investigation in some line of applied mathematics, and (b) of those who wish to make mathematics a specialty. The instruction is given, for the most part, by the aid of text-books, but several of the advanced courses are given by lectures with collateral reading. To cultivate a spirit of independent investigation, all senior and graduate students who make mathematics their major, are required to take in connection with their thesis a year's work (two-hour study) in the mathematical seminary, where the results of their investigation are presented and discussed. To the seniors and graduate students two lines of work in pure mathematics are offered, and each is given in alternate years.

Courses 10 to 24 (excepting 19) count either as graduate or undergraduate work, but in no case as both.

EQUIPMENT

The department is supplied with eighty-five of Brill's mathematical models. The collection includes an excellent set of plaster models illustrating the properties of surfaces of the second order, a set of string models for ruled surfaces, a set of paper models illustrating the real circular sections of certain conicoids, a complete set of Brill's models for the theory of functions, and a collection of surfaces of third order.

THE NATURAL SCIENCE GROUP

AIMS

The courses of the natural science group are especially intended:

1. To give a thorough liberal education with a basis in the objective sciences.

2. To prepare for the pursuit of specialties in zoölogy,

entomology, physiology, botany, or geology as a scientific career.

3. To lay in biological work and study a liberal foundation for a course in medicine.

4. To prepare for the teaching of the natural or physical sciences in high schools and colleges.

Special advantages are offered graduate students for whose work the museums, laboratories, and libraries, and the field and experimental equipment of the University and of the associated State Laboratory of Natural History, furnish an extraordinarily full provision. The University Biological Station, at Havana, is regarded as one of the University laboratories, and work done there by students may receive credit like work in any of the other laboratories.

CLASSIFICATION OF SUBJECTS

PRESCRIBED

Art and Design 1, 2; 5 hours.*
Chemistry 1, 3a or 3b, 4; 5 or 10 hours.
German B or 1, 3, 4, 6; 20 hours.
Mathematics 1 to 4; 5 hours.
Military Science 1, 2; 5 hours.
Physical Training—
Men, 1, 3; 2½ hours.
Women, 7, 9; 3 hours.
Rhetoric 2; 2 hours.

ELECTIVE

*List A** (Major Courses)*

Astronomy 4 to 6; 3 to 10 hours.
Biology 2; 5 hours.
Botany 1-5, 7, 9, 10; 10-44 hours.
Chemistry 2a, 5a, 5b, 5c, 7, 9, 9a or 9b, 12; 10 hours.
Geology 1, 2; 10 to 20 hours.
Mineralogy 1, 2; 5 or 10 hours.

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*For Explanation of "hours" see p. 167.

**No number of hours in any subject will be accepted as major work other than the number specified against that subject in list A. Credit will not be given for both major and minor work in the same subject.

Paleontology 1; 5 or 10 hours.
Physics 1, 3; 10 hours.
Physiography 1; 5 hours.
Physiology 1, 2, 3, 5; 20 to 40 hours.
Zoölogy 1, 2, 3, 4, 6, 8; 5 to 45 hours.

List B (Minor Courses)

Biology 1; 5 hours.
Geology 3; 5 hours.
Physics 2; 4 hours.
Physiology 4; 5 hours.

The major and minor courses in lists A and B in this group are respectively the maximum offerings and the minimum requirements in the various subjects of these lists.

REQUIREMENTS FOR GRADUATION

In the natural science group a student may graduate from either a specialized or a general course.

A specialized course is one containing at least two years of major work in a single subject preceding the senior year, followed by an additional year of major work in that subject, and the writing of an acceptable thesis. No student may be enrolled in a specialized course without the permission of the head of the department in which he wishes to do his principal work. Only those students who pursue a specialized course will, as a rule, be selected for fellowships, scholarships, and other similar University honors. A general course is one in which less than three years' work in any one line precedes graduation, and in which no thesis is required.

Students who specialize in geology or mineralogy may count all work done in these branches and their credits in chemistry in the list of credits required before the beginning of the senior year.

No student may graduate in natural science until he has completed all the required courses, has done at least thirty hours' work on one major elective, or forty hours' work on more than one such major (list A), and has taken at least minor courses in all the other electives in which such courses are offered (list B). The necessary number of one hundred and thirty hours for University studies may be made up by additional elections from any courses offered in the College of Science or in the College of Literature and Arts the precedent requirements for which the student can meet.

A graduate from a four years' medical course at a school recognized by the University as of high rank may, if a matriculated student, receive for his professional medical studies credits in this group equal to one year's resident study at the University, being thus enabled to obtain his bachelor's degree in science after a three years' University course.

A student taking a three years' course of prescribed science work (see page 122), followed by three years of professional work at the University Medical School, may obtain for this joint six years' course the degrees of bachelor of science and doctor of medicine.

COURSES OF INSTRUCTION

The following list of prescribed studies and major electives shows the semesters in which the principal studies of the natural science group must be taken. The prescribed studies, which are in italics, must be taken also in the year indicated. Students intending to graduate from a specialized course should begin the study of their special subjects at the earliest time practicable.

FIRST YEAR

1. *Art and Design* 1; Advanced Algebra and Trigonometry (Math. 1, 3 or 2, 4); Biology 1; *Chemistry* 1; *Military* 1, 2; *Physical Training* 1, 3 or 7, 9.

2. Analytical Geometry (Math. 6); Art and Design 2; Botany 1, 4, 5; *Chemistry* 2, 3a, or 3b and 4; *Military* 2; *Physical Training* 1, 3 or 7; Zoölogy 1, 7; Physics 2.

SECOND YEAR

1. Botany 2, 3; *German* B or 1 or 4; *Military* 2; Mineralogy 1; Physics 1, 3; Zoölogy 2, 5, 6; Biology 1.

2. Botany 1, 3, 4, 5; Geology 1; *German* B or 3 or 6; *Military* 2; Physics 1, 3; Zoölogy 1, 3 (Embryology), 4, 6 (Entomology), 7.

THIRD YEAR

1. Botany 2, 3, 7, 8, 10; Geology 1; *German* 4; Physiology 1; *Rhetoric* 2; Zoölogy 2, 4, 5, 6 (Entomology).
2. Botany 3, 4, 5, 10; *German* 6; Mineralogy 2; Paleontology 1; Physiology 1; *Rhetoric* 2; Zoölogy 3 (Embryology) 4, 6 (Entomology), 7; Biology 2.

FOURTH YEAR

1. Physiology 2; French 5; Economics 1 or Philosophy 2, 4, or 6. raphy 1.
2. Thesis (Bot. 9; Geol. 2; Physiol. 3; Zoöl. 8); Biology 2; Physiology 2; Mineralogy 2; Paleontology 1.

FULL COURSE PRELIMINARY TO MEDICINE

To students who wish to select studies leading to a degree in natural science as a liberal preparation for a course in medicine, the following course or its substantial equivalent is recommended. Graduates from this course will be required to take only the professional subjects at the University Medical School before taking the medical degree.

FIRST YEAR

1. Art and Design 1; Elementary Chemistry (Chem. 1); Mathematics 1, 3 or 2, 4; Biology 1; Military 1, 2; Physical Training 1, 3 or 7, 9.
2. Qualitative Analysis (Chem. 2, 3a); Geology 4; Bacteriology (Botany 5); Military 2; Physical Training 1, 3 or 7.

SECOND YEAR

1. Vertebrate Zoölogy and Comparative Anatomy (Zoölogy 2); Quantitative Analysis (Chem. 5a); German B or 1 or 4 or Latin*; Rhetoric 2.
2. Physics 1, 3; Organic Chemistry (Chem. 9, 9c); German B or 3 or 6 or Latin; Rhetoric 2.

*Those who offer Latin for entrance must take German in this course: those who offer German for entrance should take its equivalent of Latin before going on with German in the University.

THIRD YEAR

1. Physiology 1; German 4; Psychology 4.
2. Physiology 1; German 6; Zoölogy 3.

FOURTH YEAR

1. Physiology 2; French 5; Economics 1 or Philosophy 2, 4, or 6.
2. Physiology 2; French 5; Economics 2 or Biology 2.

Prospective students in medicine not wishing to graduate here before taking their medical course will be assisted to make up special study lists.

COMBINED COURSE IN NATURAL SCIENCE AND MEDICINE

Students desiring so to relate their science work at the University and their professional course at the Medical School as to take both the science and the medical degrees at the end of six years, may accomplish this purpose by taking the following three years' course in the College of Science, with the professional studies of the medical course thereafter:

FIRST YEAR

1. Art and Design 1; Elementary Chemistry (Chem. 1); Mathematics 3 or 1 and 3 (Trigonometry); Biology 1; Military 1, 2; Physical Training 1, 3 or 7, 9.
2. Qualitative Analysis (Chem. 2, 3a); Physics 2; Bacteriology (Botany 5); Military 2; Physical Training 1, 3 or 7.

SECOND YEAR

1. Zoölogy 2; Quantitative Analysis (Chem. 5a); German B or 1, or 4 or Latin*; Rhetoric 2.
2. Zoölogy 3; Organic Chemistry (Chem. 9, 9c); German B or 3, or 6 or Latin; Rhetoric 2.

THIRD YEAR

1. Physiology 1; German 4; Psychology 4.
2. Physiology 1; German 6; Biology 2 or Economics 2.

*Those who offer Latin for entrance must take German in this course; those who offer German for entrance should take its equivalent of Latin before going on with German in the University.

DESCRIPTIONS OF DEPARTMENTS

BIOLOGY

Under this head two courses are offered: One of elementary work in general biology, made a precedent to courses in botany and zoölogy; the other an advanced course, open only to students who have had a considerable amount of major work in zoölogy or botany or both, and intended to summarize, generalize, and extend the work of these courses on theoretical lines. Both elementary and advanced biology are taught conjointly by the departments of zoölogy and botany, the former being essentially a laboratory, and the latter a seminary course.

BOTANY

Ten courses of instruction are offered in this subject, each extending through one semester or through the year. The first two courses, each of one semester, are intended to serve a double purpose of an introduction to the work which follows for students making botany a specialty, and to afford other students an opportunity to gain the general facts of the science and to acquaint themselves with the methods of instruction. Each course as enumerated counts as major work. To a very large extent natural objects are studied rather than books, but constant endeavor is made to introduce students to pertinent existing literature. In the laboratory much use is made of the compound microscope, and special attention is given to its manipulation for best results, and to the preparation of objects. Course 8 is devoted to economic botany.

EQUIPMENT

The botanical laboratories are: One of large size with full equipment of microscopes, microtomes, aquaria, models, charts, etc., for general work; one specially arranged and fitted up for bacteriological instruction and investigation, supplied with sterilizers, thermostats, microscopes, a full line of glassware, metal vessels, and chemicals; one adjoining the latter and used in connection with it for vegetable physiology, and having attached a glazed structure, two stories in height, well adapted to facilitate experiments upon living plants and for the growth of specimens required in the laboratories. There are also provisions for private laboratory work by instructors. The department is furnished with a lecture room; a room for the herbarium and facilities for work in connection therewith; work rooms for the preparation of specimens and material; storage rooms for apparatus, utensils, reagents, and materials; dark room for photography; rooms for offices—all in convenient association and provided with the necessary materials and apparatus for ordinary class work and for advanced research.

Special attention has been given to parasitic fungi; and the collections of specimens and of the literature upon the subject are ample for various lines of original investigation.

GEOLOGY, MINERALOGY, AND PHYSIOGRAPHY

In this department three courses are offered in geology, two in mineralogy and one in paleontology.

For students who wish more than a general acquaintance with these subjects, courses aggregating twenty hours of class room and laboratory instruction have been arranged in geology, mineralogy, and paleontology. A supplementary course of ten hours is offered those who select a geological subject for a thesis.

To those who desire merely an outline of the most prominent facts and theories of geology, with some idea of the methods by which the geologist arrives at his conclusions, a course of ten hours is offered. Teachers and others who desire an introduction to the new geography are offered a ten hours' course in physiography.

EQUIPMENT

The department occupies three students' laboratories, an instructors' laboratory, a lecture room, two collection rooms, a store room, a dark room for photography, and a private office.

Apparatus.—The laboratories contain individual desks for forty-eight students, each of which is furnished with reagent bottles, Bunsen burners, and all the other apparatus now considered necessary to a complete outfit for blowpipe work in a first-class laboratory. They are also provided with a spectroscope, specific gravity and analytical balances, chemical hoods, a muffle furnace, contact and reflecting goniometers; lithological microscopes; crystal models (550); thin sections of minerals and rocks (570); an apparatus for cutting and grinding thin sections of rocks, with a Jenney motor; apparatus for micro-chemical analysis; a self-registering barometer; an aneroid barometer and a telescopic hand level for topographic work.

For the recitation room there is a set of Kiepert's physical maps; Ramsay's orographic map of the British Isles; Haart's Alps; Chauvanne's Asia; geological and soil maps of Illinois; a series of geological maps of the United States, representing land development during the successive periods; a set of charts illustrating orography, erosion, deposition of metals, etc., a set of physiographic models; a series of relief and contour maps; a complete lantern outfit, with microscopic and solar attachment; seven hundred lantern slides; an equipment for photography and the manufacture of lantern slides.

Materials.—The collection of fossils comes principally from the paleozoic, but includes a representative series from the higher groups. It contains 43,400 specimens. Six hundred and fifty of the types described in the reports of the Illinois geological survey are included, and also 200 thin sections of corals and bryozoa.

The collection of minerals contains 7,109 specimens, and that of rocks 2,912 specimens, among which is a large number of polished granites, marbles, and other ornamental building stones.

There is also a collection of Illinois soils containing 76 specimens; and a large collection of Illinois clays with their manufactured products.

PHYSIOLOGY

The special objects of the courses in physiology are as follows: (1) To give to prospective students of medicine a detailed practical knowledge of the normal histological structure and vital processes of the body, and a working familiarity with the instruments of precision used in the investigation of disease. (2) To give to students of all branches of biology a training in deducing logically necessary conclusions from data obtained by their own observations. (3) To furnish such a knowledge of physiology as will serve as a basis for future studies in hygiene.

The laboratory method of instruction is chiefly followed, supplemented, when desirable, by lectures, demonstrations, references to standard literature, and recitations. The laboratory work predominates in the major and advanced courses; the lectures, demonstrations, and recitations in the minor course.

EQUIPMENT

The department of physiology occupies four rooms in Natural History Hall; a general laboratory, a lecture room and a private laboratory on the top floor and an animal room in the basement. The general laboratory, thirty-five by fifty-six feet, is fitted at one end with desks of the most approved pattern for chemical and similar work, and at the other end with heavy tables, especially designed for use with the microscope and other apparatus requiring a stable support.

The department is equipped with a full set of apparatus for lecture demonstration and for laboratory work. Much of this apparatus has been recently imported from Europe and is of the latest and best pattern. Much of it is adapted to the most delicate work of demonstration or research, and is not to be found in the average physiological laboratory.

Among such apparatus may be mentioned a Zeiss microspectroscope for work with minute quantities of material—as blood stains in medico-legal investigations; a hæmacytometer of Gowers and of Thoma-Zeiss; Fleischl's hæmometer, DuBois Reymond induction coil, latest pattern; DuBois Reymond myographion with tuning fork and Desprez signal for measuring intervals of less than one-thousandth second; ergograph; Zimmermans-Ludwig's drum kymograph, latest pattern; Fick kymograph; sphymograph (Marey); Fleischl's spectro-polarimeter; Knop azotometer; a Kjeldahl apparatus and a complete set of Hempel's apparatus for gas analysis (technical).

The histological equipment includes a Bausch & Lomb microscope with nosepiece and sub-stage illumination for use of each student, and all the accessory apparatus and reagents for class work or research in histology. There is also a cabinet of histological specimens to which the students have access for study or reference, but the subject is taught with all the details of technique, and the student is required to prepare and examine his own material, and the specimens thus prepared remain his own property, and are of considerable value.

ZOÖLOGY

Zoölogy is taught in eight undergraduate courses, three of which are entomological, and in two graduate courses, one of which is entomological. Entrance upon the work in this department is conditioned upon general elementary biology (biology 1), upon elementary entomology (zoölogy 5), or upon high-school zoölogy or biology The courses are so organized as to lead through zoölogy 1 and 2 to advanced zoölogical work; through course 1 alone (invertebrate zoölogy), or through course 5 (elementary entomology) to general entomology; through course 2 alone (vertebrate zoölogy and comparative anatomy) to embryology and physiology and the University preparation for medical study.

One semester's work in practical entomology, intended primarily for the College of Agriculture, is offered to all University students without preliminary conditions.

EQUIPMENT

The equipment of the zoölogical department is contained in four students' laboratories, an instructor's laboratory, a lecture room, a private office, a store room, and a dark room for photography. It includes twenty aquaria, forty-eight compound microscopes of the best makes, microtomes of five patterns, and the usual equipment of incubators, paraffin baths, etc. Advanced and graduate students have the free use of the library and equipment of the State Laboratory of Natural History, which occupies rooms in Natural History Hall. They are also admitted to the privileges of the University Biological Station, at Havana, Illinois, and will be given credit for regular work done there. They are thus afforded ample opportunity for prolonged original work in several departments of zoölogical science, especially in those relating to the zoölogy of Illinois. The Bulletin of the State Laboratory is open to graduates for the publication of their papers.

Entomological students have similar access to the collections and resources of the State Entomologist's office, including a well-equipped insectary for experimental investigation.

THE PHILOSOPHICAL GROUP

AIMS

The philosophical group includes those sciences which deal both with man as an individual, in the mental and moral spheres, especially as these are connected with his physical being, and also with man in society. The branches of knowledge included in the group occupy a place among the divisions of biological science, and it is intended to carry the spirit of biology, in the commonly accepted sense, into the investigation of these subjects. The general purpose of the group is the study of the character and development of the individual and of society, of the relations of man to external nature, of the influence of natural selection on social development, and, finally, of the possible effect of artificial selection on that development, through both subjective and objective influences.

Under this caption the subjects of psychology, pedagogy, economics, public law and administration, and philosophy are offered in the College of Science as electives to all chemical and natural science students, and to all students who desire to specialize in the philosophical subjects, with studies in the physical and natural sciences as a preparation for them. All the studies of this group are junior and senior subjects.

CLASSIFICATION OF SUBJECTS

PRESCRIBED

The same as in either the natural science or chemical and physical group, pp. 118, and 103 and 107.

ELECTIVE

List A (Major Courses)

Economics 1 or 2 to 8, 11 to 19; 2 to 44 hours.*
Pedagogy 1 to 4; 5 to 20 hours.
Philosophy 1 to 8; 3 to 24 hours.
Psychology 1 to 5; 3 to 24 hours.
Public Law and Administration 1 to 9; 6 to 31 hours.

List B (Minor Courses)

Economics 1; 5 hours.
Philosophy 2; 3 hours.
Psychology 1; 5 hours.
Public Law and Administration 1; 6 hours.

REQUIREMENTS FOR GRADUATION

In this group, as in the natural science group, a student may pursue either a specialized or a general course.†

*For explanation of "hours" see p. 167.
†See p. 119.

To graduate from the College of Science in the studies of this group, in a general course, the student must either complete the subjects of the prescribed list in the chemical group,* or must carry those of the corresponding list in the natural science group** and earn twenty hours additional credit for major natural science studies, ten of which must be biological and five in physiography. He must further do forty hours' major work, or their equivalent, on subjects in the philosophical group; must take minor courses in all the philosophical subjects (except pedagogy) in which he has not completed a major course.

To graduate from this group in a specialized course the student must meet the general requirements for specialized courses, relating to thesis and amount of work required in the major subject.

Those who specialize in psychology may count all hours gained in that department, and any ten hours earned previous to the senior year in anthropology, botany, 1, 2; physiology 4; philosophy 1, 2, 6, 8; zoölogy 1; economics 17.

DESCRIPTION OF DEPARTMENTS

ECONOMICS

The instruction in this subject is based on the work of the first two years in science. The relation of the study to the biological sciences, commonly so called, is emphasized and kept steadily in view. In the courses in sociology the aim is to trace the evolution of society from primitive forms to its present complex structure, to examine the nature of its environment and its adaptation thereto, its present normal character and operations, and the forces, subjective and objective, which are at work tending to change its structure.

PEDAGOGY

See same in the College of Literature and Arts, p. 70.

*See p. 103.
**See p. 118.

PHILOSOPHY

The work in this department includes history of philosophy, metaphysics, ethics, and logic. The object of the courses is threefold:

1. To meet the wants of those who desire to specialize.
2. To give those who desire a more general knowledge of these subjects some familiarity with the sphere of philosophical speculation and with the philosophical method as applied to the principles and presuppositions of the various sciences.
3. To show the relation of philosophy to practical life and the value of its study as a means of general culture.

PUBLIC LAW AND ADMINISTRATION

See same in the College of Literature and Arts, p. 71.

PSYCHOLOGY

The object of this department is twofold. The aim is, first, to acquaint the student experimentally with psychic phenomena and to make him familiar with recent literature and standard authorities; and, second, to make contributions to the science itself.

For the suitable preparation of the student for higher work, he is from the first required to deal with the subject as an experimenter, and thus given a practical knowlege of the phenomena which he is to handle. The laboratory is well equipped with materials and apparatus for the continuation of this work through a large number of classical experiments upon sensation, which the student is required to conduct himself and of which a careful record is kept. The higher mental functions are then studied in a similar way, and the experimenter held responsible for the purity of the experimental conditions and the method of procedure. As a preparation for this, scientific methods and the logic of experimentation are made objects of special study. The history of psychology is also taken up. A full line of periodical literature is made accessible by the University, and this serves as the basis of reports in the seminary. In order to give a comprehensive survey of psychic activities, the genesis of mind with its accompanying development of neural structure is traced from the lower forms of life to its culmination in adult man.

For the accomplishment of the second aim of the department, that of original research, the laboratory is well equipped with suitable apparatus and every incentive is given toward a high grade of work. Investigations not immediately connected with the laboratory are also encouraged. The plan of this higher work is formed on a coöperative basis, so that each investigator not only receives the assistance of his fellow students, but is also allowed to participate in their work.

COLLEGE OF AGRICULTURE

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT.
EUGENE DAVENPORT, M.AGR., DEAN, Animal Husbandry.
THOMAS J. BURRILL, PH.D., LL.D., Botany and Horticulture.
STEPHEN A. FORBES, PH.D., Zoölogy.
CHARLES W. ROLFE, M.S., Geology.
DONALD MCINTOSH, V.S., Veterinary Science.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Art and Design.
SAMUEL W. PARR, M.S., Applied Chemistry.
DAVID KINLEY, PH.D., Economics.
ALBERT P. CARMAN, SC.D., Physics.
EVARTS B. GREENE, PH.D., History.
GEORGE T. KEMP, PH.D., M.D., Physiology.
JACOB K. SHELL, M.D., Physical Training.
EDGAR J TOWNSEND, PH.M., Mathematics. (On leave.)
VIOLET D. JAYNE, A.M., English.
WILLIAM H. VANDERVOORT, M.E., Mechanical Engineering.
HARRY S. GRINDLEY, SC.D., SECRETARY, Chemistry.
HERMAN S PIATT, A.M., French.
ARTHUR HILL DANIELS, PH.D., Philosophy.
CHARLES W. TOOKE, A.M., Public Law and Administration.
FRANK SMITH, A.M., Zoölogy.
PERRY G. HOLDEN, M.S., Agricultural Physics.
JOSEPH C. BLAIR, Horticulture.
OSCAR QUICK, A.M., Physics.
JOHN P. HYLAN, PH.D., Psychology.
WILBER J. FRASER, B.S., Dairying.

AGNES S. COOK, A.B., Rhetoric.
M. B. HAMMOND, PH.D., Economics.
NEIL C. BROOKS, PH.D., German.
CHARLES W. YOUNG, M.S., Botany.
ALBERT R. CURTISS, Woodworking.
HENRY JONES, Blacksmith.

AIMS AND SCOPE

The College of Agriculture aims at the higher education of the rural people and their elevation both in a business and in a social sense. It believes that civilization is the fruit of labor as well as of thought; that thought is most healthy in an active body, and that in the future, as in the past, development will come largely through those who intelligently labor.

It believes that every man needs two educations; one that is technical, to fit him for business, another that is cultural, to fit him to live; one to make him efficient and independent as to means of support, the other to develop and to train his better faculties; one to insure comfortable existence, the other to make the most of that existence. This College attempts to secure both of these for the young land owner, believing that neglect of one leads to incompetency and distress, while the want of the other dwarfs the individual and prevents his greatest usefulness. In other words, it seeks to provide that education which will best serve the needs of a rural people living in a cultured nation and under a free government.

The strictly technical portion constitutes about one-third of the course. The aim is not so much to develop and teach rules of practice as to discover the principles and to establish the laws of agricultural science. Of the remaining two-thirds of the course more than half is prescribed in the sciences. This is done both for their own sake and to fortify the technical work of the course. Because of this and because the subject-matter and the methods of the technical portion lie so fully within the domain of science, the course is essentially scientific rather than literary, and it is believed that the sciences afford a favorable field for the development of the higher faculties of the mind. Yet the College is mindful of the fundamental character of history, literature, and political science as training studies, and reasonable attention to these subjects is required.

METHODS OF INSTRUCTION

Instruction is by laboratory work, supplemented by text-books, lectures, and reference readings, which are almost constantly assigned from standard volumes and periodicals. Laboratory methods of study are regarded as peculiarly suited to the subjects of this course and the needs of its students, and a liberal equipment has been provided for students' use and for purposes of illustration.

EQUIPMENT

The equipment for the technical work of the course is increasing rapidly. The department of agricultural physics is fitting up laboratories for investigation in soil physics and in mechanical analysis of soils. The dairy department is equipped with a plant for laboratory work in testing, pasteurizing, separating, creaming, and churning, and for investigation in dairy bacteriology.

For illustration and practice in expert judging, the College owns a stud of Morgan horses, herds of Jersey, Shorthorn, and Holstein-Friesian cattle and a choice flock of Shropshires.

The department of veterinary science is provided with a model of the horse in *papier maché*, capable of dissection into nearly one hundred parts. There are also natural specimens illustrating nearly every disease of bone to which the horse is subject.

The College makes free use of the extensive fields, orchards, and gardens in which the Agricultural Experiment Station conducts experiments in methods of culture, effect of various practices upon yield and upon fertility, varieties of fruits, vegetables, and forage crops from corresponding latitudes in various parts of the world. The methods employed and the results secured are freely used for instruction. This is the more readily accomplished because for the most part the instructors are also in charge of the experiments.

The ornamental grounds which surround the University buildings contain about twenty acres, and are kept neat and attractive. These, with their trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks and drives of different construction and styles, furnish illustrations for the classes in landscape gardening. A greenhouse contains a collection of plants of value to the classes in floriculture and landscape gardening.

The cabinets contain a series of colored casts of fruits, enlarged models of fruits and flowers, collections of seeds of native and exotic plants, of specimens of native and foreign woods, of beneficial and injurious insects, and of specimens showing their work; numerous dry and alcoholic specimens and preparations; photographs, maps, charts, diagrams, drawings, etc.

The college has a supply of compound microscopes and other apparatus, and students have opportunity to learn their use and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

Agriculture is beginning to have a literature, and the library contains a large collection of works on agriculture by standard authors in English, French, and German; also reports of agricultural departments of this and other countries, journals of agricultural societies, both in America and abroad, besides nearly all the standard agricultural periodicals of the United States and many from Europe and Australia. The student not only has free access to this literature, but is constantly assigned reference readings as a part of his class work.

In work other than the purely technical, the agricultural student meets the same instructors and enjoys the same privileges as other students of the University, and in all departments the laboratory method is freely employed, in which the student uses apparatus with his own hands and consults the literature of the subject at every step.

CLASSIFICATION OF SUBJECTS

PRESCRIBED

Agriculture 1, 2, 3; 12½ hours.*
Animal Husbandry 1, 2, 3; 9 hours.
Art and Design 1; 3 hours.
Botany 1, 2, 5; 10 hours.
Chemistry 1, 3b, 4, 13; 20 hours.
Dairy Husbandry 1, 2; 3½ hours.
Economics 1 or 2; 2 or 3 hours.
English 1; 5 hours.
Horticulture 1, 2, 5; 9 hours.
Military 1, 2; 5 hours.
Physical Training—
  Men, 1, 3; 2½ hours.
  Women, 7, 9; 3 hours.
Rhetoric 2; 6 hours.
Thesis; 10 hours.
Veterinary Science 2; 5 hours.
Zoölogy 2, 7; 10 hours.

Students are allowed to elect between animal husbandry 2, 3 and an equal amount of time in horticulture.

If the student has entered without botany or zoölogy, one or both, he will need to take biology 1 preparatory to the prescribed work in botany or zoölogy. If he has entered without physiology he should elect physiology 4 before taking animal husbandry 2.

REQUIREMENTS FOR GRADUATION

The degree of bachelor of science is conferred upon the presentation of an acceptable thesis after the completion of the prescribed subjects and sufficient electives to make 130 semester hours.

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*For explanation of "hours" see p. 167.

COURSE OF INSTRUCTION

Required for the Degree of B.S. in Agriculture

First Year

1. Animal Husbandry 1; Dairy Husbandry 1; Art and Design 1; Chemistry 1; Horticulture 1; Military 1, 2; Physical Training 1, 3 or 7, 9.
2. Agriculture 1; Botany 1; Chemistry 3b and 4; Dairy Husbandry 2; Horticulture 2; Military 1, 2; Physical Training 1, 3 or 7.

Second Year

1. Veterinary Science 2; Botany 2; Rhetoric 2; Military 2; Electives.
2. Agriculture 2; Zoölogy 7; Rhetoric 2; Military 2; Electives.

Third Year

1. Physics 2; Zoölogy 2; English 1; Electives.
2. Agriculture 3; Botany 5; Economics 2; Electives.

Fourth Year

1. Animal Husbandry 2, 3; Thesis; Electives.
2. Horticulture 5; Thesis; Electives.

WINTER SCHOOL IN AGRICULTURE

For the winter school students are admitted without entrance examination to a special short course in which are daily lectures and class exercises on some of the most important practical branches of agriculture, horticulture, and veterinary science. This course is designed for young men already engaged in agricultural pursuits who cannot spend a long time in college, and yet are anxious to make the most of themselves and of their vocation. Such students have access to the library and museum collections of the University, and have admission to the courses of general lectures.

The details of this course vary from year to year. A special circular giving full information concerning it is issued each year several weeks before the Christmas holidays.

STATE LIBRARY SCHOOL

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT.
KATHARINE L. SHARP, PH.M., B.L.S., DIRECTOR, Library Economy.
MARGARET MANN, Cataloguing.
MAUDE W. STRAIGHT, A.B., Reference.
GRACE O. EDWARDS, B.S., B.L.S., Library Economy.
GERTRUDE SHAWHAN, B.L., Cataloguing.

AIMS AND SCOPE

The *Library School,* which had been conducted at Armour Institute of Technology, Chicago, since September, 1893, was transferred to the University of Illinois in September, 1897.

The scope of the work of the school has been broadened since the time of the transfer. There is now offered a four years' course of study, leading to the degree of bachelor of library science. Two years of the course are devoted to general university studies, and this is the smallest preparation which will be accepted for entrance upon the technical work. Students are encouraged to complete a four years' college course before applying for admission. This high standard is necessary because conditions in library work are rapidly changing. It is not enough to have a knowledge of books, nor is it enough to have a knowledge of methods. One or two years of training will not take the place of years of experience, but they will make the student more adaptable and general library service more intelligent.

Instruction is given in each department of library administration. Stress is laid upon simplicity and economy, although elaborate methods are taught to enable students to work in large libraries where bibliographic exactness is required. The higher side of library work is emphasized throughout the course, and students are taught their responsibility to the schools, to the clubs, to the factories, to university extension, and to the people as organized bodies and as individuals.

It is the purpose of the University to graduate librarians who are not only trained, but educated; librarians who are not only equipped in technical details, but filled with an appreciation of their high calling to furnish "the best reading to the greatest number at the least cost."

The school offers a course of twelve lessons, open to all students of the University, on the use of the library and the ordinary reference books.

METHODS OF INSTRUCTION

There are so few text-books on library economy that instruction is given almost altogether by lecture and laboratory methods. References to books and periodicals are given for collateral reading, and individual research is encouraged from the start. Lectures are illustrated by the collections of forms and fittings and each student is expected to do a certain amount of practical work in the University library each day. Before completing the course, each student must have had actual experience in every department of the library. Class room work is tested by problems, and examinations take the form of problems wherever practicable.

EQUIPMENT

The most valuable equipment is the working library of the University.

The Library School has the complete collection of manuscript notes and problems which have been prepared since the school opened in 1893. As text-books are so few, this collection is invaluable. A collection of library reports and catalogues and of mounted samples, showing methods of administration in all departments, is carefully classified and is continually increasing. A collection of card catalogues of various forms has been made, including the book forms from Leyden, Holland; Cassel, Germany; and Florence, Italy; the Rudolph indexer and the modern forms approved by the American Library Association. Other forms are represented by photographs.

The school has a collection of printed blanks and forms illustrating methods of administration in different types of libraries, many labor-saving devices, and samples of fittings for all departments. The school received much material from the World's Columbian Exposition in 1893, and is constantly receiving additions from librarians and manufacturers throughout the country.

A collection of cataloguing rules and of classification systems is making for comparative study. A number of devices and patents, such as temporary binders, pamphlet cases, newspaper files, etc., have been contributed by inventors and manufacturers.

REQUIREMENTS FOR GRADUATION

Credit for 65 hours,* including the prescribed military and physical training, in addition to two years' prescribed technical library work, is required for graduation. The technical work is of junior and senior grade, and must be taken at the University, but the work of the first two years covers general university studies and may be taken at any college from which credits are accepted.

COURSE OF INSTRUCTION

Required for the degree of B.L.S.

The work of the first two years may consist of any of the courses offered in the University, the requirements for which students can meet.

*For explanation of "hours" see page 167.

THIRD YEAR

1. Elementary Library Economy (Lib. 1); Elementary Reference (Lib. 2); Selection of Books (Lib. 3); Elementary Apprentice work (Lib. 4).

2. Elementary Library Economy (Lib. 1); Elementary Reference (Lib. 2); Selection of Books (Lib. 3); Elementary Apprentice Work (Lib. 4).

FOURTH YEAR

1. Selection of Books (Lib. 3); Advanced Library Economy (Lib. 5); Bibliography (Lib. 6); History of Libraries (Lib. 7); Advanced Reference (Lib. 8); Advanced Apprentice Work (Lib. 10).

2. Selection of Books (Lib. 3); Advanced Library Economy (Lib. 5); Bibliography (Lib. 6); Advanced Reference (Lib. 8); Book-making (Lib. 9); Advanced Apprentice Work (Lib. 10); Thesis (Lib. 11).

SCHOOL OF MUSIC

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT.
WALTER HOWE JONES, DIRECTOR OF SCHOOL, Piano.
ALISON MARION FERNIE, R. A. M. (London), P. A. M. (Philadelphia), Voice.
ALICE PUTNAM, Violin.
JESSIE YOUNGE FOX, Piano.

AIMS AND SCOPE

The School of Music offers courses leading to the degree of bachelor of music.

The courses are widely varied. Although regular courses are laid out, students may spend an indefinite amount of time in the study of an instrument or of the voice.

The course in the history of music, as well as the work in the University Orchestra and the University Oratorio Society, may be taken by regular students in other departments.

A course of artists' concerts is given each season under the management of the School of Music. In these concerts, to which an admission fee is charged, only artists of the best reputation appear.

The instructors in the School of Music give recitals and lectures on musical subjects during the year.

REQUIREMENTS FOR GRADUATION

Credit for 130 semester hours, including military and physical training credits, together with an acceptable thesis, is required for graduation with the degree of bachelor of music. The thesis required for graduation must be on a topic related to music.

Students who are not working for a degree in music may receive a certificate of work done by complying with the following conditions:

Students of the piano, organ, or violin must complete the entire course specified for these instruments; must also complete the work offered in harmony, covering thirteen hours, and must take one year's work (ten hours) in either German or French.

Students of the voice must complete the entire course offered in vocal work, the thirteen hours' work in harmony and one year's work on the piano, besides taking one year (ten hours) of German or French, and one year (ten hours) of Italian.

Special and preparatory music students are required, in addition to their practical work in music, to pursue other lines of study sufficient to fill in their spare time.

Students enrolled in the department of music only pay no semester fees, but must pay the music fees. (See p. 265.)

CLASSIFICATION OF SUBJECTS

PRESCRIBED

Music 1; 2 hours.*
Music 2a; 13 hours.
Music 2b; 3 hours.
Music 2c; 3 hours.
Music 2d; 3 hours.
Music 3b, 4b, 5b or 6b; 56 hours.
French or German; 10 hours.
Italian 1; 10 hours.
Mathematics 4; 2 hours.
Military 1, 2; 5 hours.
Physical Training—
  Men, 1, 3; 2½ hours.
  Women, 7, 9; 3 hours.
Physics 1, 3; 5 hours.
Rhetoric 1; 6 hours.

*For explanation of "hours" see p. 167.

The remaining hours of credit may be obtained in electives offered in the College of Literature and Arts, choice of subjects being left to individual students.

MUSICAL ORGANIZATIONS

The University Glee Club is an organization for men. Membership is decided by competition and is limited to sixteen in number. The club meets twice a week for rehearsal.

The Young Ladies' Glee Club is an organization for the young ladies of the University, and is in charge of the vocal department.

The Mandolin and Guitar Club is open to young men who play these instruments. Membership is decided by competition, and the club is associated with the Glee Club in its concerts.

The Military Band is conducted by the director of the School of Music. It furnishes music for important University occasions and appears at battalion drill of the military department, besides giving several concerts during the year. Membership is limited to thirty in number and is decided by examination.

The University Orchestra meets for a two hours' rehearsal once a week, and is open to all students who play any orchestral instrument ordinarily well.

The University Oratorio Society meets once a week for rehearsal of choral works, especially oratorio choruses. Membership is free to students. Singers not connected with the University are admitted on the payment of a small fee.

GRADUATE SCHOOL

ORGANIZATION

The Council of Administration of the University is in charge of the Graduate School, and the executive officer, to whom communications should be addressed, is the Dean of the Graduate School.

ADMISSION AND REGISTRATION

Graduates of the University of Illinois, and of other colleges and universities of approved standing, may be admitted to membership in the Graduate School upon presentation of their credentials. Other persons suitably qualified may gain admission by special vote of the Council of Administration upon such conditions as may be imposed in each case. Candidates for admission may secure application blanks from the Dean, and these, properly filled out, should be filed, together with such documentary matter as may be presented showing qualifications for membership in the school, with that officer. This should be done not later than the time set for registration in September. Admission may be granted at other times, but the time limit required for degrees counts from the date of the certificate of membership. In the case of non-residents, correspondence should be commenced early, so that the details can be completed by the time mentioned.

With the exceptions named below, all members of the Graduate School are required to be in regular attendance at the University, and to do all the work for which they are registered in the departments to which such work belongs. In case of absence on leave, or when absence is necessary to carry on investigations included in approved courses of study, the requirement of continuous residence may be modified by the Council of Administration. Graduates of this University may be admitted as non-resident members of the

Graduate School; and all members of the School who have completed the residence period required for advanced degrees may register as non-residents while completing the work required for such degrees.

Members of the Graduate School register with the Dean during the registration period of each semester. This in the case of non-residents may be done by letter stating the work to be undertaken during the ensuing half-year.

STUDIES AND EXAMINATIONS

As far as can be indicated by a statement of time, full work for a graduate student consists in the use of forty-five hours a week in the lecture rooms, laboratories, etc., and in private study. Assignments of work are made upon this basis; but great variations naturally result from the subject-matter in hand, and from the abilities of individuals. Each student must select one principal line of study, called his major subject, and upon this major subject at least one-half of his work must be done; and any greater proportion of his time, up to the whole of it, may be thus devoted if proper approval is had. When work upon the selected major subject is not arranged to require all of the student's attention, he must choose one or two minor subjects, as may be necessary to complete a full course of study. Usually, at least one minor subject should be taken. Not more than two may be taken at the same time.

The major study must be approved as graduate work for this University. The minor subjects may, under aproval, be chosen from the offerings to graduates, or, except in the College of Engineering, from undergraduate courses exclusive of those usually open to freshmen. But all candidates for advanced degrees must direct their selection toward some well-defined end, determined for the most part by the character and purpose of the major study.

In architectural and engineering subjects, at least the major line of study and not less than two-thirds of the entire work must be taken from lists marked "primary,"* and any

*See the courses for graduates in architecture and other engineering courses, in the "General Description of Courses," pp. 176, 192, 201, 226, 231.

remaining amount to complete a full course may be taken from those designated "secondary," under the same head with the primary list.

All courses of study leading to degrees in the Graduate School are subject to approval, first, by the head of the department of the University in which the major subject for each student belongs; second, by the Dean of the College including such department; and, third, by the Dean of the General Faculty. The signatures of the heads of departments in which chosen minor subjects belong must also be obtained before the list reaches the Dean of the General Faculty. The lists of studies, as finally approved, are deposited with the Registrar of the University. No changes may subsequently be made except under the same line of approvals, but extension of time may be arranged with the professors concerned and with the Dean of the General Faculty.

Examinations are required in all subjects, and reports upon these are made to the Registrar of the University. Graduate students in undergraduate classes are examined with these classes.

The head of the department in which the student does his major work is charged with the direction and supervision of such major work, and, in a general way, with the supervision of the student's entire course of study. He fixes the time and method of all examinations not otherwise provided for, sees that they are properly conducted, and reports results to the Registrar. It is his duty also to keep the Dean of the General Faculty informed concerning all matters affecting the interests of the student, and of the School in connection therewith.

DEGREES AND FELLOWSHIPS

A full statement regarding the degrees conferred by the University may be found on later pages of this catalogue, and in the same connection an account of fellowships. (See pp. 249 and 253.

SCHOOL OF LAW

FACULTY

ANDREW S. DRAPER, LL.D., PRESIDENT AND ACTING DEAN.
CHARLES C. PICKETT, A.B., Professor of Law of Contracts, Equity, and Carriers.
WILLIAM L. DREW, LL.B., Professor of Law of Torts, Agency, and Corporations.
THOMAS W. HUGHES, LL.M., Assistant Professor of Law of Real Property, Evidence, and Commercial Paper.
CHARLES W. TOOKE, A.M., Assistant Professor of Public Law and Administration, Instructor in Law of Domestic Relations, and Commercial Law.

LECTURERS

HON. OLIVER A. HARKER, Judge of the Appellate Court of Illinois, Lecturer on Criminal Law.
HON. CHARLES G. NEELY, Judge of the Circuit Court of Cook County, Lecturer on the Preparation for and Conduct of Trials.
HON. BENJAMIN R. BURROUGHS, Judge of the Appellate Court of Illinois, Lecturer on the Law of Real Property.
HON. FRANCIS M. WRIGHT, Judge of the Appellate Court of Illinois, Lecturer on the Law of Easements.
HON. CHARLES C. STALEY, County Judge of Champaign County, Lecturer on Probate Law and Administration of Estates.

Special courses of lectures will also be given by other gentlemen.

REQUIREMENTS FOR ADMISSION

1. All applicants for admission to the School of Law must be at least 18 years of age and of unquestionable character.

2. Graduates of colleges and of scientific schools of approved standing are admitted upon diploma or certificate without examination.

3. Graduates from any approved high school in the state are admitted in the same way.

In the absence of proper certificates the usual examination will be required.

ADVANCED STANDING

The following persons will be admitted to advanced standing:

1. Persons who produce from another law school, in good standing, certificates of having satisfactorily pursued courses in law, included in the following schedule, and received credit therein, *provided* that the time spent on such courses is equivalent to the time spent on the same courses in this school. Otherwise, an examination on such courses, given by the instructors in this school, must be satsfactorily passed.

2. Persons who have studied law privately or in an attorney's office, and pass examinations prescribed by the faculty of the School.

3. Members of the bar of this state, who will be admitted to the third year class without examination as candidates for the degree of LL.B.

SPECIAL STUDENTS

Students who do not desire to be candidates for a degree may take one or more courses as special students upon approval of the faculty of the School under regulations to be prescribed. Such students will receive credit for work satisfactorily done, and may become candidates for graduation at any time by meeting the requirements of the School.

METHODS OF INSTRUCTION

The methods of instruction used in this School are based largely upon the study of cases. Text-books are used to some extent, and lectures are occasionally resorted to, but the study of the case is regarded as the chief means to the attainment of legal knowledge and proficiency.

LIBRARY AND MOOT ROOM

The library consists of the leading text books on all subjects: Supreme and Appellate Court Reports of Illinois; United States Supreme Court Reports; New York, Ohio, Massachusetts, Iowa, Wisconsin, Michigan, and Indiana Reports; American Decisions, American Reports, and American State Reports; the current volumes of the West Company Reporter System, and the leading legal periodicals. Additions of reports and text-books will be made during the coming year.

The Moot Court is held once a week for the purpose of familiarizing the student with legal procedure. It is presided over by Judge Harker, the other officers being elected by the law students from their own body. Every student is required to be present and to perform such duties as may be assigned him.

LEGAL STUDY AND UNIVERSITY WORK

The Council of Administration will, upon application, in proper cases, apply credits earned in the School of Law upon other University courses.

Students matriculating in the School of Law may take any of the following courses in the College of Literature and Arts, subject to the approval of the instructors having such courses in charge, and of the instructors in the School of Law: Public law and administration; economics and social science, history, and early English legal codes. By special arrangement other work in the College of Literature and Arts may also be taken.

COURSE OF INSTRUCTION

Required for the Degree of LL.B.

FIRST YEAR

1. Contracts (Law 1); Torts (Law 2); Real Property (Law 3).

2. Contracts (Law 1); Torts (Law 2); Real Property (Law 3); Domestic Relations (Law 4); Criminal Law (Law 5).

SECOND YEAR

1. Evidence (Law 6); Sales (Law 7); Real Property (Law 8); Common Law Pleadings (Law 9); Damages (Law 11).

2. Evidence (Law 6); Agency (Law 10); Bailments and Carriers (Law 12); Guaranty and Suretyship (Law 13).

THIRD YEAR

1. Equity (Law 14); Corporations (Law 15); Commercial Law (Law 16); Wills (Law 17); International Law (Law 21).

2. Equity (Law 14); Corporations (Law 15); Partnership (Law 18); Constitutional Law (Law 19); Equity Pleadings (Law 20).

SEMINARY COURSE IN LEGAL HISTORY

During the year there will be given a seminary course in legal history under the joint direction of the instructors in the School of Law and Mr. Schoolcraft, of the department of history. It is proposed to study in detail the Year Books covering a limited period with special reference to land tenures, feudal obligations, and the practice in the courts. This course is for advanced students only, and a reading knowledge of Latin and French is essential.

REQUIREMENTS FOR GRADUATION

The requirements for graduation with the degree of bachelor of laws are sixty-six semester hours of work, and a thesis, etc., embodying the results of original research upon a subject approved by the faculty of the School of Law. A "semester hour," as here used, means one hour per week of class room work for one-half of a year. The degree will be conferred upon the completion of the course set forth above.

ADMISSION TO THE BAR

Under the rules of the Supreme Court of Illinois, candidates for admission to the bar of this state must have had a high school education or its equivalent, must have completed a three years' course of study in a law school or law office, and must then pass an examination to be given by the State Board of Bar Examiners.

THE SCHOOL OF MEDICINE

[For Faculty of the School of Medicine, see p. 16.]

HISTORY

The School of Medicine, the College of Physicians and Surgeons, is located on the corner of Harrison and Honore Streets, Chicago, in the heart of the medical quarter of the city. It was founded in the year 1882 by a number of representative physicians and surgeons. In 1892 the College had a thorough reorganization, and erected a commodious laboratory building—the first building exclusively for laboratory purposes erected by any medical school in the West. Since that time it has grown with steadiness and rapidity. The attendance in 1895-96 was 235; in 1896-97, 308; in 1897-98, 408; and in 1898-99 is 514, 35 of the attendants being women. It became the Medical Department of the University in April, 1897.

Chicago is already the center of medical study in the United States. In the winter of 1897-98 it contained a larger number of medical students than any other city in the western hemisphere. These students are distributed among fourteen medical colleges, of which the College of Physicians and Surgeons is the second, as to the size of its classes, and is not outranked by any in respect to its facilities, or the scope and thoroughness of its curriculum, or in regard to the place it occupies in the esteem of the medical profession.

SESSIONS

The collegiate year is divided into two sessions, the winter session, which begins on the third Tuesday in September and ends on the third Wednesday in April; and the spring session, which begins on the third Thursday in April and ends during the last week-day in June. The winter session is obligatory. The spring session is a supplementary course designed to furnish students opportunities to do special work and to make up arrearages of study.

REQUIREMENTS FOR ADMISSION, SESSION OF 1899-1900

First, a certificate of good moral character from two reputable physicians.

Second, a diploma from a recognized college, academy or high school, or other proof of scholarship equivalent to, at least, three years' work in a high school approved by the University of Illinois. Students unable to meet this requirement are accepted upon passing a satisfactory examination in the following subjects:

(a) English: The writing of an essay of at least two hundred words on a selected subject. Goldsmith's Vicar of Wakefield will furnish the basis of examination in English for this year.

(b) Physics: The principles of mechanics and hydraulics, Mechanics' Natural Philosophy, Part I., is recommended in preparation.

(c) Mathematics: Arithmetic and algebra; plane geometry, as given in Wells's or Wentworth's Geometry.

(d) Latin grammar and an examination in translating Latin into English from "Cæsar's Commentaries," representing at least two years' study of Latin in an accredited high school. One year will be allowed in which to remedy defects in Latin.

Beginning with the fall of 1900 the entrance requirements will be as follows:

First, a diploma of an accredited high school or academy of the University of Illinois, or of a similarly accredited school of another University, whose entrance requirements are equivalent to the entrance requirements of the University of Illinois.

Or, second, entrance examination covering the following subjects:

1. ALGEBRA.—Fundamental operations, factoring, fractions, simple equations, involution, evolution, radicals, quadratic equations and equations reducible to the quadratic form, surds, theory of exponents, and the analysis and solution of problems involving these. The subject as given in Wells's Higher Algebra through quadratic equations, or the same work in Wentworth's Algebra, or an equivalent.

2. COMPOSITION AND RHETORIC.—Correct spelling, capitalization, punctuation, paragraphing, idiom, and definition; the elements of Rhetoric. The candidate will be required to write two paragraphs of about one hundred and fifty words each to test his ability to use the English language. The subject as presented in Genung's Outlines of Rhetoric, Scott and Denney's English Composition, or an equivalent.

3. ENGLISH LITERATURE.—(a) Each candidate is expected to have read certain assigned literary masterpieces, and will be subjected to such an examination as will determine whether or not he has done so. The books assigned for the next year are as follows:

Dryden's Palamon and Arcite; Pope's Iliad, Books I., VI., XXII., and XXIV.; The Sir Roger de Coverley Papers in the Spectator; Goldsmith's The Vicar of Wakefield; De Quincey's Flight of a Tartar Tribe; Cooper's Last of the Mohicans; Lowell's Vision of Sir Launfal; Scott's Ivanhoe; Shakspere's Macbeth; Milton's Paradise Lost, Books I. and II.; Burke's Speech on Conciliation with America; Macaulay's Essays on Milton and Addison; Tennyson's The Princess.

(b) In addition to the above, the candidate will be required to present a brief outline of American Literature. Hawthorne and Lemmon's Outline of American Literature, or an equivalent..

4. LATIN.—Such knowledge of inflections and syntax as is given in any good preparatory Latin book, together with the ability to read simple fables and stories; also four books of Cæsar's Gallic War, or its equivalent in Latin of equal difficulty. The ability to write simple Latin based on the text.

5. GEOMETRY.—Plane Geometry, as given in Wells's or Wentworth's Geometry, or an equivalent.

6. HISTORY.—At least one year in one of the following subjects: (a) The History of England and of the United States; (b) General History; (c) The History of Greece and Rome.

7. PHYSICS.—The elements of physical science as presented in such text-books as Appleton's School Physics, or Avery's Elements of Natural Philosophy, or Carhart and Chute's Elements of Physics, or Gage's Elements of Physics.

The entrance examination will be conducted in writing by a committee outside of the Faculty of the School of Medicine appointed by the President of the University, and will be held at the medical college at 10 a. m. on the Monday preceding the opening of the winter and spring terms.

ADVANCED STANDING*

Students who have received the degree of bachelor of arts or bachelor of science, and those who have completed a "medical preparatory course," equivalent to that given by the University of Illinois, and graduates of reputable schools of pharmacy, veterinary science, or dental surgery, whose course extends over two years, may enter the sophomore class and complete their studies upon three years of attendance, provided they fulfill all other requirements for admission and graduation. *Students thus advanced may not complain of any conflict of hours, nor absent themselves from any part of the lower conflicting course;* but they may make up deficiencies in the work of the winter session during the spring course in such branches as are represented in that course.

COURSE OF STUDY*

The curriculum required for graduation extends over four years. During the first two years the work is confined to the sciences fundamental to practical medicine. During the freshman year this consists of work in histology, biology, embryology, chemistry, human anatomy, physiology, and materia medica. During the sophomore year the study of physiology, chemistry, and human anatomy is continued, and in addition the student takes up pathology, bacteriology, and therapeutics. With the junior year the study of the practical branches of medicine is begun. The entire subjects of practice of medicine, surgery, and obstetrics are covered in recitation courses. The student also begins clinical and bed-

*For Combined Undergraduate and Medical course of six years, leading to the degrees of B.S. and M.D., see p. 122.

side work and receives instruction in medical and surgical specialties. More advanced work along the same lines is continued in the senior year. Practice of medicine, surgery, and obstetrics are gone over again, this time in lecture courses and with greater minuteness of detail and profuseness of illustration. The various special departments of medicine and surgery are presented with like thoroughness, and a large part of the student's time is given to clinical study.

METHOD OF INSTRUCTION

During the first two years the time of the students is about equally divided between laboratory and didactic work. The plan of instruction in the School contemplates the freest use of laboratory teaching. Wherever possible practical laboratory work is made to supplement didactic teaching. Students are taught not only by prepared specimens, but they are required to prepare their own specimens from the original material, and are thus made familiar with technical methods, so that they become able independently to carry a technical investigation through all of its stages. During the junior and senior years the time is about equally divided between clinical and didactic work, with, perhaps, a preponderance of clinical instruction in the senior year. This clinical instruction is carried on, as far as possible, with the student at the patient's side. Attendance upon clinics is required in the same way as upon lectures, and the students are graded upon, and given credit for, their work in the clinical courses just as they are for the work in the didactic and laboratory courses. During the winter sessions the students of the junior and senior years are divided into classes for dispensary work, and these classes have instruction in rotation in the various departments of practical medicine. During the spring term the dispensary clinics are thrown open to students of all classes.

EQUIPMENT

The college building is a six-story structure on the corner of two wide streets, with an open space around it on all sides. It is heated by steam and provided with all modern conveniences. It contains three well-lighted and well-ventilated amphitheaters, the smallest of which seats two hundred students. In these amphitheaters the usual lectures are given. Adjacent to the college building on the west is the laboratory building. The laboratories contained therein are among the largest and most complete possessed by any medical college in the United States. They occupy four floors, three of them 25x100 feet each, and one 25x56 feet. Each will accommodate one hundred and twenty students at a time. They are provided with desks and lockers for students' use, and are well adapted to the work for which they are severally intended. Adjoining the laboratories are preparation rooms for the use of demonstrators and professors. There is a bone room, to which students have free access for the study of osteology. In the department of pathology the collections furnish ample material for the macroscopical as well as the microscopical study of diseased tissues. The store rooms are connected with all the laboratories by means of an elevator. The School has for the use of students over 130 modern microscopes of late continental and American patterns, a sufficient number of which are equipped with oil emersion lenses. There are also an ample number of microtomes for students' use, besides microtomes of special construction for particular kinds of work, electric projection apparatus of latest design, and all other apparatus in any way necessary for students' work or for the illustration of lectures.

FREE DISPENSARY

The dispensary occupies the first floor and a portion of the second floor of the main building. Connected with the reception room are fourteen clinic rooms for the accommodation of the various specialties in medicine and surgery. During the past five years there have been treated in these rooms an average of twenty thousand patients each year.

HOSPITAL FACILITIES

Members of the faculty and other friends of the School have recently purchased the adjoining building of the Post-Graduate Medical School and converted it into a hospital of 125 beds. It is a large, handsome structure, 50x100 feet, five stories high, of modern construction, and completely furnished. It is connected with the college amphitheater by a corridor and its clinical resources are thus made easily available for the instruction of students. Directly opposite the School is Cook County Hospital, the only free hospital in Chicago. It contains almost a thousand patients, and supplies a quantity and variety of clinical material which no private institution can command. In the amphitheater of the hospital much of the clinical instruction of the School is given. In addition to the foregoing resources members of the faculty are connected with various other hospitals of the city and freely draw upon them for the benefit of students. An entire floor of this hospital is reserved as a ward for patients who are maintained in hospital by the School for the instruction exclusively of its students. It is designed to increase this hospital facility as necessity indicates.

REQUIREMENTS FOR GRADUATION

First, a certificate of good moral character by two reputable physicians.

Second, satisfactory deportment during attendance at college.

Third, satisfactory evidence that the candidate is twenty-one years of age.

Fourth, proof that the candidate has attended at least four full courses of instruction in four separate years, the last of which shall have been in this institution.

Fifth, certificate that the candidate has pursued the study of practical anatomy during two years and to the extent of having dissected at least the lateral half of the human body.

Sixth, certificate that the candidate has attended two full courses of dispensary and hospital clinics.

Seventh, payment of all the college fees in full.

LIBRARY

The College has for several years had a reference library of several hundred volumes. This library owes its foundation to the gift to the College of the collection of books of the late Prof. A. Reeves Jackson. It has been added to largely from time to time by contributions from members of the faculty and other friends of the College. Its usefulness has recently been greatly augmented by gifts from the Dean of the Faculty, in consideration of which, and of provision made for its permanent maintenance and growth, it has been named by the faculty the Quine Library. It already contains practically every book of reference required by medical students, and the important medical periodicals. In point of size and completeness it is the second medical library in Chicago, Newberry Library being the first, and in attendance of readers it is the first. It is in charge of a trained librarian, and is open daily from nine to five for the use of students.

More detailed information concerning the School may be obtained by application to the Registrar of the University, Urbana, Ill., or to the Secretary of the School of Medicine, William Allen Pusey, A.M., M.D., 103 State Street, Chicago.

THE SCHOOL OF PHARMACY

[For Faculty of School of Pharmacy, see p. 20.]

HISTORY

The Chicago College of Pharmacy is a corporation which was founded by prominent pharmacists of Chicago and vicinity in 1859 for the purpose of advancing the practice of pharmacy. One of the first steps taken was the establishment of a school of pharmacy. At that time there was no school of the kind west of the Alleghany Mountains. Members and friends contributed money, books, apparatus, and supplies; teachers were secured and a course of lectures was instituted in November, 1859.

The first class, of but two students, was graduated in 1861. The war caused a suspension of the teaching, and the school was not reopened until 1870. The great fire, in 1871, destroyed the equipment, but pharmacists throughout Europe and America extended help to the institution, furnishing an excellent library and outfit of apparatus, which became the nucleus of the present complete equipment. In 1872 the instruction was resumed for the second time and has since continued without interruption.

"The Pharmacist," a monthly journal published by the College, from 1866 until 1886, did much to advance the interests of pharmacy in the West.

In 1880 the members and graduates of the College took an active part in the formation of the Illinois Pharmaceutical Association, which, in the following year, secured the passage of the pharmacy law.

The twenty-fifth anniversary of the founding of the College was signalized by the completion and occupation of a building in which ample space for many years' growth was provided. The better accommodations gave an impulse to better work. Up to this time instruction had been given mainly by means of lectures, laboratory work being entirely optional. Laboratory courses in pharmacy, chemistry, and vegetable histology were now made obligatory. A laboratory devoted entirely to prescription compounding was established in 1892. The excellence of the equipment in this department won for the College a medal and diploma at the World's Columbian Exposition.

The College was formally united with the University May 1, 1896, and is now conducted as the technical "School of Pharmacy of the University of Illinois." In the management of the School the Trustees and officers of the University have the assistance of an advisory board of pharmacists elected by the registered pharmacists of the state through the Illinois Pharmaceutical Association.

The School is situated near the business center of Chicago. In addition to the larger amphitheater, known as "Attfield Hall," which has a seating capacity of three hundred and fifty, the building occupied has a smaller hall especially fitted for lectures and demonstrations in chemistry, and capable of seating one hundred and fifty persons. The chemical and pharmaceutical laboratories, as well as the microscopical laboratory and the dispensing laboratory, are commodious and well appointed.

The courses of instruction, covering two terms of twenty-six weeks each, extending from October 3d to April 20th, afford opportunities for a thorough technical training, such as is necessary for the successful practice of pharmacy. The subjects taught are pharmacy, chemistry, botany, and materia medica.

The system of teaching includes lectures, demonstrations, recitations, written and oral examinations, as well as individual instruction in actual work in operative and dispensing pharmacy, analytical chemistry, use of the compound microscope, etc. Much time is devoted to laboratory practice.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must furnish evidence of their ability to prosecute the work of the course successfully.

The preliminary education should be equivalent to that required for entrance to a good high school.

Students who have pursued courses of study in other colleges of pharmacy will be given credit for such portions of their work as are equivalent to the work required by this college.

REQUIREMENTS FOR GRADUATION

The candidate for the degree of graduate in pharmacy must be twenty-one years of age, must have had four years' practical experience in pharmacy, including the period of attendance at college, and must have attended two full courses of instruction, the first of which may have been in some other reputable college or school of pharmacy. He must have attended regularly the laboratory and lecture courses of this College, must pass the examinations, and must not have been absent more than five times during the term from either laboratory exercises or lectures in any department.

Candidates may present themselves for examination during the last year of their required experience or of their attainment of legal majority.

To students who complete a third year's work, embracing principally instruction in more advanced pharmaceutical chemistry and in bacteriology, the degree of pharmaceutical chemist is offered. Drug-store experience will not be required for this degree.

Persons competent to fulfill the general requirements of admission to the University may be granted credit upon the University courses for equivalent work satisfactorily completed at the School of Pharmacy.

Further information is given in the special announcement of this school. Address W. B. Day, Actuary, School of Pharmacy, 465-7 State Street, Chicago, Ill.

HOUSEHOLD ECONOMICS

The University offers a group of courses selected from various departments to form a complete scientific basis for planning, decorating, and managing a home.

Household sanitation and chemistry of foods will be in charge of a woman especially equipped for such work, who will at the same time correlate the various courses given by the other instructors.

The courses are as follows:

ARCHITECTURE

A special course is offered to students in household economics in house-planning and house decoration. See Architecture 25.

BACTERIOLOGY (BOTANY 5)

This course extends through the second semester, ten hours a week. Eight to ten weeks are devoted to a general introduction to the science and the methods of laboratory work, the nature and characteristics of bacteria, their kinds and special effects, the preparation of nutrient media, securing and continuing pure cultures, microscopical preparations, etc. After this each student may select a subject or line of subjects for special study and investigation. These may be of direct interest and importance to the housekeeper, and include besides general sanitary matters, such topics as fermentation and putrefactive changes in foods and food substances; beneficial and injurious organisms and their effect in breadmaking, in milk products, etc.; bacteriological examination of water and of air; the preservation of organic substances; cleansing and fumigating clothing, rooms, apparatus, etc.; and the distribution and elimination of disease germs.

Required: Chemistry 1 and Zoölogy 10.

CHEMISTRY

Two years of chemistry are offered for students of household economics.

Subjects of the first year are: General elementary chemistry. (Chem. 1). Qualitative analysis. (Chem. 3 b). Elements of organic chemistry. (Chem. 4.)

For the second year several different courses are available. These should be grouped substantially as follows: Either (1): Quantitative analysis (Chem. 5a), and chemistry of foodstuffs (Chem. 5c). This includes analysis and testing of milk, butter, cereals, meats, etc.

Or, (2): Agricultural chemistry (Chem. 13).

Or, (3): Household chemistry (Chem. 23).

This course includes analyses of baking powders, vinegars, syrups, sugars, soaps, etc., etc.

Sanitary analysis of water, air, etc. (Chem. 10), and proximate organic analysis (Chem. 21) afford opportunities for investigation of food supplies in both the raw and prepared state.

ECONOMICS

The problem of domestic service is a phase of the labor problem. Students in household economics will be assigned special topics for report under economics 13.

The problem of household expenditure is to get the largest return from a given income. Statistics and experience show that certain items of expenditure are always in a certain proportion to income. A knowledge of what has been written on this subject is therefore of value to the housekeeper. The subject will be treated in connection with the labor problem and theory of consumption, (Economics 12 and 13).

PHYSIOLOGY

Work in this course consists of microscopical and chemical study of food and digestion.

Required: Chemistry 1 and Zoölogy 10.

GENERAL DESCRIPTION OF COURSES

Following the description of each course of instruction will be found the necessary requirements, if any, for admission to that particular course. Careful attention must be given to these requirements and to the sequence of studies thus indicated. For instance, under Architecture 4, for students of the College of Engineering, page 171, there are required "Physics 1 and 3," and "Architecture 2 and 3." Turning now to these subjects, it is found that physics 1 and 3 are the major course of one year, architecture 2 is wood construction, and architecture 3 is metal construction. All these subjects must be satisfactorily passed before admission may be had to the class in architecture 4.

In case a course not required for graduation is selected by less than five students, the right to withdraw the same for the term is reserved.

Graduate courses of instruction are described under the various subjects, as a rule after the undergraduate courses. They are numbered upward from 100. Other courses may often be arranged by the professors in charge to meet the special requirements of students. The subjects in which graduate courses are announced for 1899-1900 are as follows:

Agriculture, architecture, botany, chemistry, civil engineering, Danish language, economics, electrical engineering, French, geology, Greek, history, mechanical engineering, municipal and sanitary engineering, pedagogy, philosophy, psychology, theoretical and applied mechanics, zoölogy.

Credit is reckoned in semester "hours," or simply "hours." An "hour" is either one class period a day for one semester, each class period presupposing two hours' preparation by the student; or the equivalent in laboratory, shop, or drawing room.

The semester, the days, and the class period or periods during which each course is given, and the number of "hours" it counts, are shown after each course, as follows: The semester is indicated by the Roman numerals I, II; the days, by the initial letters of the days of the week; the class period or periods (of which there are nine each day, numbered consecutively from one to nine), by Arabic figures; and the "hours" or amount of credit, by Arabic figures in parentheses. For example, after the description of Agriculture 4, (p. 169) occur the abbreviations II.; M., W., F.; 2; (3). These are to be read second semester, Monday, Wednesday, and Friday, second period, three "hours."

AGRICULTURE

1. AGRICULTURAL ENGINEERING.—Study of farm machinery, its use and abuse; fences, kinds and construction; laying out and construction of farm drains, etc. *II., second half; daily; 1 and 2; (2½).* Assistant Professor HOLDEN.

2. AGRICULTURAL CROPS.—Yields, distribution, and cost of production, and methods of handling farm crops. Varieties for different sections of Illinois. Conditions of growth and methods of securing the same by cultivation. *II.; daily; 5; (5).* Assistant Professor HOLDEN.

Required: Chemistry 1.

3. FERTILITY.—Influence of fertilizers on the amount, character, and composition of crops. Effects of particular crops upon fertility and upon each other, when grown in succession or together. Nitrogen and leguminous crops. Conservation of fertility by the rotation of crops. Economic sources of the elements of fertility; fertilizers and manures, their valuation and use under both extensive and intensive methods. *II.; daily; 6; (5).* Assistant Professor HOLDEN.

Required: Botany 1; Chemistry 1, 3a, 4.

4. COMPARATIVE AGRICULTURE.—Influence of locality, climate, soil, race, customs, laws, religion, etc., upon the agriculture of a country, and incidentally upon its people. One crop only, and its effect, as rice; Indian corn in American agriculture and affairs. Varying conditions under which the same crop may be produced,

as wheat. Statistical agriculture. Influence of machinery and of land titles, whether resting in the government, in landlord, or in occupant. Relation of agriculture to other industries and to the body politic. *II.; M., W., F.; 2; (3).* Professor Davenport.

Required: Two years of University work.

5. Agricultural Experimentation.—A systematic study of the work of experiment stations and experimenters in this and other countries, together with a critical study of correct principles and methods of experimentation, especially designed for such students as desire to fit themselves for work in original investigation in experiment stations or elsewhere. *I.; Tu., Th.; 2; (2).* Professor Davenport.

Required: Two years of agriculture.

6. There is required for graduation one year of original investigation in some agricultural subject, the methods and results of which are to be embodied in the form of an acceptable thesis. *I. and II.; arrange time; (10).*

ANIMAL HUSBANDRY

1. Live Stock.—Origin of th breeds of domestic animals and their distinguishing characters; adaptation of breeds for particular purposes and their value for grading, accompanied by critical study and practice in the art of judging both as to breed type and as to constitution and individual merit; care, and management of the live stock of the farm as to housing and feed, particularly directed to the economic sources of feeding stuffs, their equivalency and suitable preparation. *I.; M., Tu., W., Th.; 1; (4).* Professor Davenport.

2. Stock Feeding.—Functional activities of the animal body and the end products of their metabolism. Foods are considered, first chemically, as affording the materials for these activities, whether in construction of body tissues or of animal products, as meat, milk, etc.; second dynamically, as supplying the potential energy for these processes, and for labor, speed, etc. A study of the development of the animal after birth and of the phenomena of animal nutrition from the economic standpoint, in which animal activity is considered as an agent for transformation of energy and the resultant product as a source of profit. *I.; first half; daily; 3; (2½).* Professor Davenport.

Required: Botany 4; Physics 2; Physiology 4; Zoölogy 1.

3. Stock Breeding.—Variation, its extent and importance, both in nature and under domestication; how far inherent and how far

induced by environment. Correlated variation. Selection. Survival of the fittest. Effects of use and disuse. Intercrossing. Hybridism. Grading. Breeding in line and inbreeding. Instinct and intelligence. Acquired characters and their inheritance. The aim is to bring every known principle of reproduction to the assistance of the breeder's art, and to study the methods of successful breeders and their results. *I.; second half; daily; 3; (2½).* Professor DAVENPORT.

Required: Zoölogy 3; Physiology 4 or entrance physiology.

ANTHROPOLOGY

1. GENERAL ANTHROPOLOGY.—This course begins with a study of the physical and psychical elements of ethnography. Theories as to the origin of man are discussed, and the various races of mankind are distinguished and described. Special attention is given to the historical and comparative study of customs, ceremonies, rights, beliefs, and folklore of primitive peoples, with reference to the common characteristics and fundamental instincts of mankind, and to the origin and growth of existing customs and social institutions. *I.; M., W., F.; 1; (3).* Assistant Professor DANIELS.

Required: A major or minor course in economics, geology, psychology, or zoölogy.

ARCHITECTURE

2. WOOD CONSTRUCTION.—Formulæ and data for computing dimensions and strength of columns, beams, girders, etc., of wood or metal, are given and applied in the solution of examples. Wood and its uses in construction and decoration, seasoning, shrinkage, defects, and modes of protection from decay. Construction and design of wooden floors, walls, ceilings, and roofs, and joinery, doors, windows, bays, inside finish, cornices, wainscoting, stairs, etc. *Kidder's Building Construction and Superintendence; Part I.; Jones's Logarithmic Tables. I.; M., W., F.; 6, 7, and 8; (3).* Assistant Professor McLANE.

Required: General Engineering Drawing 1, 2.

3. MASONRY AND METAL CONSTRUCTION.—Foundations of stone, brick, concrete, and piles; materials employed in stone masonry, their uses, defects, qualities, and modes of preparation. Kinds of masonry and external finish. Tools for stone cutting and their use. Preparation of working drawings, with application to the arch, vault, and dome. Brick masonry, its materials, and bonds. Manufacture and

refining of cast iron, wrought iron, and steel, with processes of pattern-making, molding, casting, refining, rolling, etc., and standard dimensions or sections. Special properties and value of metal in a structure, designing a line of columns in mercantile building, and of beams, girders, and footings, together with the study of joints and connections. *Kidder's Building Construction and Superintendence, Part II., II.; Tu. F.; 6, 7, and 8; (3).* Assistant Professor McLane.

Required: General Engineering Drawing 1, 2.

4. Sanitary Construction.—Recitations and lectures, designs for special problems. Study of plumbing, trap ventilation, removal of wastes, construction of water closets, drains, and systems of water supply; sewage disposal. Water supply and fixtures in dwellings. *Gerhard's Sanitary Engineering; Lectures on Sewage Disposal. I.; Tu., Th., F.; 6; (3).* Assistant Professor McLane.

Required: Physics 1, 3; Arch. 2, 3.

5. Graphic Statics and Roofs.—Elements of graphic statics and applications in designing trussed roofs. Forces, equilibrium, reactions, moments, bending moments, and shears on beams, center of gravity, moment of inertia and kern of cross sections. Construction of wooden and of metallic roofs, mode of computing loads on roof trusses, obtaining end reactions, drawing strain diagrams, and determining sectional dimensions of members, with the designing of joint connections. *Ricker's Trussed Roofs; Ricker's Elements of Graphic Statics. II.; M., W., F.; Section A, 1, Section B, 2; also 3 hours' drawing a week; (3).* Assistant Professor McLane.

Required: Math. 2, 4, 6; Theoretical and Applied Mechanics 1 and 2 or 4 and 5.

6. History of Architecture.—Continues through the year and is taken with architecture 7 and 11. Commencing with Egyptian and ending with modern styles, a careful study is made of the more important styles, examining historical conditions, local and inherited influences, structural materials and system, special ornaments, purposes and designs of the buildings, with the most important typical examples of each style. Especial attention given to ideas useful or suggestive in American work, and to tracing gradual evolution of architectural forms. One recitation and two illustrated lectures a week. References made to Fergusson, Lubke, Durm, Reber, Gailhabaud, etc. *Hamlin's History of Architecture; Van Dyke's History of Painting; Marquand's History of Sculpture. I.; M., Tu., W.; 4; (3). II.; M., Tu., W.; 3; (3).* Professor Ricker.

Required: Architecture 4.

7. DETAILS OF STYLES.—Exercises in drawing at large scale the most important details of the Grecian, Roman, Early Christian, Byzantine, Mohammedan, Romanesque, Gothic, and Renaissance styles. Taken with Architecture 6. *Notes and Sketches. I.; Th.; 1, 2, 3, and 4; (1). II.; W.; 6, 7, and 8; (1).* Assistant Professor McLANE.

Required: Architecture 2, 3, 8.

8. THE ORDERS OF ARCHITECTURE.—A study of the Five Orders of Architecture, and architectural Shades and Shadows. A careful study of the proportions and details of the Orders is first made with lectures, recitations, blackboard sketches from memory, and problems requiring the use of the Orders. *Ware's Five Orders; Lectures on Shades and Shadows. I.; Tu., 4, 6, 7, and 8; Th., 6, 7, and 8; (3).* Assistant Professor TEMPLE.

Required: Gen. Eng'g Drawing 1, 2; Architecture 20 or 21.

9. MONTHLY PROBLEMS.—Preliminary instruction in rendering.—An entire day in each month during the second and third years is devoted to a problem in design, requiring the use of the Orders. Program is made known at beginning of the exercise, and sketches must be completed and rendered during the same day. Credit is given for this study only after the completion of each year. *I. and II., the last Th. in each month, all day; (½ for each semester).* Assistant Professor TEMPLE.

Required: General Engineering Drawing 1, 2.

10. WORKING DRAWINGS.—Conventional methods for representing the different parts of buildings in general and in detail, conventional colors and sectioning; systems of lettering and figuring drawings; working drawings; tracing; drawing for copying. *II.; Tu.; 6, 7, and 8; (1).* Associate Professor WHITE.

Required: Architecture 2 and 3.

11. ARCHITECTURAL SEMINARY.—Reports and discussions of original investigations of assigned topics in History of Architecture; reviews of books, abstracts of current technical journals, and other publications. Taken with Arch. 6 and 7. *I.; F.; 4; II.; F.; 3; (1).* Professor RICKER.

12. SUPERINTENDENCE, ESTIMATES, AND SPECIFICATIONS.—This study comprises several specialties not otherwise provided for, so far as they can be taught in a professional school. The subjects treated include the duties of a superintendent, his relations to architect, owner, and contractor, the method of supervising work, systems of keeping building accounts, the usual methods of measurement

of materials and work, arrangement of computations in proper and convenient order, and approximate prices of material and labor, which vary in different localities. The methods of estimating by squaring, cubing, units, and quantities are each employed and illustrated by problems. A study is made of the general and special clauses of specifications and of their arrangement, as well as of methods of classifying material to facilitate writing specifications. Practice is obtained by writing several sets. *Clarke's Building Superintendence; Lectures on Building Law; Ricker's Notes on Estimates; Bower's Specifications. I.; Tu., W., 5; Th., 4 and 5; (3).* Associate Professor WHITE.

Required: Architecture 4.

13. HEATING AND VENTILATION.—Scientific theory and practice of warming and ventilating buildings is the object of this study. Commencing with fuels and production of heat, then passing to flow of gases through ajutages and pipes, applying these data to calculation of dimensions of air ducts and chimneys. Different systems of heating by furnaces, hot water, steam, etc, are next examined, with details of each. Sources of impurity in the air and requirements of good ventilation are then considered, with the different methods of ventilation by aspiration, by fans, etc., ending with the study of fans of different types. Numerous problems are given, and heating plants designed. *Carpenter's Heating and Ventilating Buildings; Ricker's Notes on Heating and Ventilation. I.; M., F., 4 and 5; Tu., W., 4; (4).* Associate Professor WHITE.

Required: Architecture 4, 15; Physics 1, 3.

14. ARCHITECTURAL PERSPECTIVE.—Theory of perspective is taught with labor-saving methods of abbreviating work, and designing in perspective is made a special aim, being very useful to a draftsman in preparing sketches for clients. Problems in angular, parallel, vertical, and curvilinear perspective, as well as in perspective shades and shadows, are solved, requiring original work as far as possible, so as thoroughly to prepare the student for any kind of work in perspective, instead of restricting him to the study and use of a single system. *Ware's Modern Perspective. II., Tu., 6, 7, and 8; Th., 3, 6, 7, and 8; (3).* Assistant Professor TEMPLE.

Required: General Engineering Drawing 1, 2; Architecture 2, 3, 8, 20 or 21.

15. REQUIREMENTS AND PLANNING OF BUILDINGS.—Lectures are fully illustrated by plans sketched on the blackboard, which must be embodied in students' notes. Numerous problems in planning are

given. *II.; M., W., Th., F.; 2 and 3; (3).* Associate Professor WHITE.

Required: General Engineering Drawing 1, 2; Architecture 2.

16. RESIDENCE DESIGN.—Practice in design, and study of the requirements for dwellings. The work is limited to residences, since this class of buildings is likely to afford the graduate his first opportunity for independent original work. *Osborne's Notes on House Planning.* Lectures and blackboard sketches to be copied in students' notes. *II.; Th., F.; 4 and 5; (2).* Associate Professor WHITE.

Required: Architecture 4, 8.

17. ARCHITECTURAL DESIGNING.—Elementary architectural forms are first traced and sketched from memory; simple problems in design are then solved by sketch plans, elevations and sections, rendered in shade or color as required. The object is to obtain as much practice in original design as possible, and to form a collection of suggestive tracings and sketches. *I.; M., W.. F.; 1, 2, and 3; (3).* Assistant Professor TEMPLE.

Required: Architecture 6, 7, 8, 9, 11, 20 or 21.

18. ARCHITECTURAL COMPOSITION.—A careful study is made of the laws of architectural design and of the results of experience embodied in the text-book, with numerous references to other authors. Commences with general principles, passing to an examination of proportions employed in most important styles, arrangement of plan, external design in general and detail, ceilings, and interiors, arrangement of corridors, stairways, and entrances, of internal courts, and of halls for large assemblages. Frequent problems in design afford practical applications of the principles. *Ricker's Translation of Architektonische Composition* (Handbuch der Architektur). *II.; Tu, W., Th., F., 4 and 5; (4).* Professor RICKER.

Required: Architecture 6, 7, 11, 17, 20 or 21.

19. ARCHITECTURAL ENGINEERING.—This continues the study of graphic statics, commenced in "Graphic Statics and Roofs," with applications to metallic roofs of wide span, roof trusses of curved or unusual form, and those supported by abutments and jointed. Spherical and conical trussed domes. Effect of moving loads on girders, the graphical analysis of the arch, vault, and dome, and of the Gothic system of vault and buttress. Construction and details of steel skeleton buildings. Practical applications are made to a series of problems in design for specified cases. *Ricker's Notes on Advanced Graphics; Freitag's Architectural Engineering; Ricker's Translation of Wittman's Arch and Vault.* References to the works

of Planat, Landsberg, DuBois, Clarke, Ott, Levy, Muller-Breslau, etc., on Graphic Statics. *I; M., W., F.; 1; (3).* Associate Professor WHITE.

Required: Math. 2, 4, 6, 7, 9; Theoretical and Applied Mechanics 1 and 2; Architecture 2, 3, 4, 5.

20. ARCHITECTS' ART COURSE I. Prescribed.

Any three of Art and Design 1, 2, 3, 5, 6, 13. *I; daily; (3).* Professor FREDERICK.

21. ARCHITECT'S ART COURSE. Optional.

Any three of Art and Design 5, 6, 7, 8, 11, 13. *I; daily; (3).* Professor FREDERICK.

Required: Architecture 20.

The art and design courses offered as Architecture 20 and 21 are varied to meet the special needs of students of architecture.

22. RENAISSANCE DESIGN.—A prescribed series of tracings of important details is made, and problems in design are worked out as fully as time permits. *I.; M., W., F.; 6, 7, and 8; (3).* Assistant Professor TEMPLE.

Required: Architecture 17, 18.

22b. RENAISSANCE DESIGN.—More advanced design of the same character as 22. This may be taken instead of Architecture 23 or 24. *I.; Tu., Th.; 1, 2, and 3; (2).* Assistant Professor TEMPLE.

Required: Architecture 17, 18, 22.

23. GOTHIC DESIGN.—*M., W. or Tu., F., 2 and 3; Th., 2; (2).*

24. ROMANESQUE DESIGN.—*I.; M., W. or Tu., F., 2 and 3; Th., 2; (2).*

In each of these courses, 23 and 24, a prescribed series of tracings of important details is made, and problems in construction and design are worked out as fully as time permits. The same lectures will be given in both courses, and will be illustrated by lantern slides and blackboard drawings. The work in Architecture 22b will be accepted in lieu of either of the above courses. *Ricker's Translation of "Redtenbacher's Leitfaden."* Professor RICKER and Associate Professor WHITE.

Required: Architecture 6, 7, 11, 14, 18, 20 or 21.

25. DESIGN OF ORNAMENT.—The study of historical ornament with exercises in designing architectural ornament to decorate the structural forms usually found in practice. These designs will be charcoal or crayon sketches, drawings rendered in shade or color, or finished drawings. They will be made on as large a scale as possible, usually full size. *Lectures. Meyer's Hand-book of Orna-*

ment. II.; M., Tu., W.; 3, 4, and 5; (3). Assistant Professor TEMPLE.

Required: Architecture 6, 7, 11, 17, 18, 20.

26. VACATION SKETCHES.—At the beginning of the third and fourth years, each student is expected to present a suitable number of vacation sketches for approval by Assistant Professor TEMPLE.

27. DOMESTIC ARCHITECTURE. (For a class of not less than six students in Household Economics).—The elements of the planning, sanitation, decoration, and furnishing of dwellings.

One lecture weekly on planning and arrangement, with exercises in making skeleton plans, by Associate Professor WHITE.

One lecture weekly on water supply and fixtures, sanitary fixtures and plumbing, heating and ventilation, by Assistant Professor McLANE.

One lecture weekly on decoration and furnishing by Professor RICKER.

A considerable amount of additional reading will be required. *II; Arrange time; 2, 3 or 4; (3).*

COURSES FOR GRADUATES

Primary

101. Construction of Extensive Wooden Buildings.

102. Recent Uses of Stone, Brick, and Terra Cotta in Architecture.

103. Metallic Skeleton Buildings.

104. Fire-resisting and Fire-proof Buildings.

105. Sanitation of Public and Semi-public Buildings.

106. Researches on the Evolution of Architectural Styles.

107. Higher Applications of Graphic Statics.

108. Heating and Ventilation of Large Buildings.

109. Higher Studies in Architectural Design.

110. Researches and Experiments in Applied Esthetics.

111. Translation of an approved Technical Architectural Work from the French or German.

112. Indexing and Classification of Periodicals, Books, Data, and Technical Information for Architects and Engineers.

Secondary

113. Stereotomy Applied to American Problems.

114. Examinations of Heating and Ventilation of Buildings.

115. Photography for Architects.

116. Methods of Reproducing Drawings, Specifications, etc., for Architects.

117. Higher Problems and Methods in Perspective.

118. Practice in Estimates, Specifications, etc., for Large Buildings.

119. Higher Industrial Design.

120. Advanced Water-color Painting.

121. Study of Office Methods and Arrangements.

122. Any *primary* offered in the College of Engineering.

123. Electric Lighting and Wiring for Buildings.

ART AND DESIGN

1. FREE-HAND PERSPECTIVE.—Lectures on free-hand perspective illustrated by drawing from geometric solids. Principles applied by drawing groups of common objects, as books, vases, chairs, etc.; casts of ornament; details of the human figure; interiors and exteriors of buildings; plants and flowers from nature. *Frederick's Notes on Free-hand Drawing. I., daily; section A, 1 and 2, section B, 3 and 4, section C, 6 and 7; (3).* Mr. LEWIS.

2. CHIAROSCURO.—Drawings shaded in charcoal, crayon, or chalk, from still-life and casts of ornament (a preparation, following course 1, for courses 4, 5, 6, and 7). or from casts of the figure (a preparation for courses 3, 8, and 9). *Cross's Light and Shade. II.; daily; section A, 1 and 2, section B, 3 and 4, section C, 6 and 7; (3).* Mr. LEWIS.

3. THE ANTIQUE.—Artistic Anatomy of the human figure. Study of action and expression. Outline and shaded drawings from the antique figure. Study of the head and costumed model. *Momson's Anatomy for Art Students. I.; M., W.. F.; 3 and 4; (3).* Professor FREDERICK.

Required: Art and Design 2

4. ELEMENTARY WATER COLOR PAINTING.—Study of casts and still-life in monochrome and color. *II.; daily; section A, 1 and 2, section B, 3 and 4, section C, 6 and 7; (3).* Mr. LEWIS.

Required: Art and Design 1.

5. ADVANCED WATER COLOR PAINTING.—Groups for study of composition and color. Fruit and flower from nature. Landscape sketching from nature. *II.; section A, M., W., F., 3 and 4; section B, M., W., F., 6 and 7; section C, Tu., Th., S., 3 and 4; (3).* Professor FREDERICK.

Required: Art and Design 4.

6. Oil Painting.—Groups in monochrome. Still-life, fruit, and flowers in color. *II.; section A, M., W., F., 3 and 4; section B, M., W., F., 6 and 7; section C, Tu., Th., S., 3 and 4; (3).* Professor Frederick.

Required: Art and Design 1, 2 or 4.

7. Advanced Oil Painting.—Study of landscape and portrait painting. *II.; section A, Tu., Th., S., 3 and 4; section B, M., W., F., 6 and 7; (3).* Professor Frederick.

Required: Art and Design 6.

8. Modeling.—Copy of ornament; ornament from photograph; details of human face; time sketches from life. Casts are made of at least one modeled piece; arm, hand, or foot from nature; foliage, fruit, or vegetable from nature. *Frederick's Plaster Casts and How They are Made. I.; section A, Tu., Th., S., 3 and 4; section B, M., W., F.; 6 and 7; (3).* Professor Frederick.

Required: Art and Design 1 or 2.

9. Advanced Modeling.—Bas-relief from antique figure; anatomical rendering of an antique figure; bust from the antique; portrait from nature in the round or relief; copy of statuette; figure in round from photograph; original design introducing the figure. Casting from piece, sulphur, and gelatine molds. *II; Tu., Th., S.; 3 and 4; (3).* Professor Frederick.

Required: Art and Design 8.

10. Pen Rendering.—(Work with pen and ink arranged to suit the needs of students from all departments.)—Architectural rendering; birds, shells, flowers, etc.; drawings made with a view to their reproduction; book illustration; decorative lettering and design. *I.; section A, Tu., Th., S., 3 and 4; section B, M., W., F., 6 and 7; (3).* Professor Frederick.

Required: Art and Design 1 or 2.

11. Architectural Sketching. (This course, which is the same as course 4, during first half of semester intended primarily for students of architecture.)—Perspective in water-color; color as a means of interior decoration; sketching from nature. *I.; daily; 3 and 4; (5).* Professor Frederick.

Required: Art and Design 1, 4.

12. Relation of Design to Manufacture. (A course in industrial design, arranged for special students of design).—*II.; section A, M., W., F., 3 and 4; section B, M., W., F., 6 and 7; section C, Tu., Th., S., 3 and 4; (3).* Professor Frederick.

Required: Art and Design 5, 8, 10.

Lectures, open to all students in the department, on perspective, historic ornament, composition and design, are given at hours not devoted to work in the studios. Special students in Art and Design are expected to attend and do required outside work.

ASTRONOMY

4. General Astronomy.—Minor course. The course aims to supply a general knowledge of the facts of astronomy, a clear conception of underlying principles, and some acquaintance with the methods of arriving at these facts. Studies are made in the location of constellations and stars. In this course, practical questions are considered, though not made matters of chief importance, the literary and purely scientific features of the science being assigned chief prominence. *Young's Elements of Astronomy,* also *Young's General Astronomy. II.; daily; section A, 4; section B, 6 (5).* Professor Myers and Mr. Brenke.

Required: Mathematics 4.

5. General Astronomy and Cosmogony.—This is a continuation of course 4, and together with 4 it constitutes a line of study for students who wish to pursue astronomy as a major subject. In the latter part of this course the evidence both for and against the Nebular Theory is reviewed. The rôle of the tides in cosmogonic development receives special consideration, and the present view of the origin and cosmic history of the earth-moon system, together with the testimony of astronomy relating to it, are recapitulated to the epoch where astronomy yields to geology. A summarized statement of the results of the researches of Darwin and of Lord Kelvin is included. *I.; M., W., F.; 6; (3).* Professor Myers and Mr. Brenke.

Required: An entrance credit in astronomy.

6. Practical Astronomy.—This course, which is offered both for engineers and special astronomical students, is intended to give the student training in the use of instruments of precision. As a subordinate matter, he is introduced to instruments of a higher grade than those employed in ordinary surveying. A second purpose of the course is to train the student in the art of computing. Model forms of record and reduction for problems are set before him and the advantage of compact and orderly arrangement of all work is strenuously insisted upon. As a concrete outcome of the above training, the student should acquire the ability to determine latitude, time, and azimuth with such instruments as are used in the ordinary

practice of civil engineering. An essential part of the work is the theory of astronomical instruments. *Campbell's Practical Astronomy. I.; Tu., Th.; 1 and 2; (2).* Professor MYERS and Mr. BRENKE.

Required: Astronomy 4.

7. THEORY OF ORBITS AND SPECIAL PERTURBATIONS.—This course embraces the following subjects: The formation and integration of the differential equations of motion of a system of bodies and the derivation of the laws of undisturbed elliptic, parabolic, and hyperbolic motion. An investigation of the various formulæ and methods for finding the special perturbations of a heavenly body constitutes an essential part of this course. The methods of Encke, Hansen, and of Variation of Parameters, are developed and studied at length. *Oppolzer's Lehrbuch der Bahnbestimmung.* Professor MYERS.

Required: Mathematics 1, 3, 7, 9, 14, 16; Astronomy 4. [Not given in 1899-1900.]

9. CELESTIAL MECHANICS.—This course is a continuation of course 7, and has to do chiefly with the development and discussion of the absolute perturbations both for the case in which the orbital eccentricities and inclinations are small, and in which they are so large as to make the ordinary series too slowly convergent, or even divergent. Some time is also given to the study of subjects connected with figures of equilibrium of the heavenly bodies, and such other questions as are treated in Tisserand's Mecanique Celeste. Professor MYERS.

Required: Astronomy 7. [Not given in 1899-1900.]

11. CALCULUS OF VARIATIONS.—See Mathematics 20.

12. SPHERICAL HARMONICS.—See Mathematics 21.

13. POTENTIAL FUNCTION.—See Mathematics 22.

10. ASTRONOMICAL SEMINARY AND THESIS.—The work of this seminary is on subjects either related to those considered in the senior courses, or connected with questions arising out of thesis investigations. This course is given in conjunction with Astronomy 7 and 9, or with Mathematics 12 and 13, according as the one or the other is current. *I. and II.; Tu., Th.; 7; (2).* Professor MYERS.

BIOLOGY

1. ELEMENTARY BIOLOGY.—This is a laboratory and lecture course on the morphology, physiology, and œcology of both botanical and zoölogical types. The work is so directed as to lead to an

acquaintance with the simpler generalizations of biology, and is intended as a preparation for the more extensive and thoroughgoing work of the major courses in botany and zoölogy. *I.; daily; 1 and 2; (5).* Assistant Professor SMITH and Mr. YOUNG.

2. ADVANCED GENERAL BIOLOGY.—For those who have taken a year's work in either botany or zoölogy, a single term of general biology is offered and especially recommended. It is intended to review, systematize, extend, and unify the student's knowledge of the phenomena and laws of life and of the relations of plant and animal, of living and non-living matter, and of biology to the other sciences. It will be taught as a seminary subject, with occasional lectures and assigned readings. It is primarily a junior or senior study. *II.; daily; 6 and 7; (5).* Professors BURRILL and FORBES.

Required: A major course in Botany or Zoölogy.

BOTANY

1. HISTOLOGY AND PHYSIOLOGY.—General vegetable histology and vegetable physiology, or an introductory study of the cells and tissues of plants and their courses of development in structures and organs; and studies in the general activities of plants correlated with external conditions. Lectures or recitations and laboratory work. *II.; daily; 6 and 7; (5).* Professor BURRILL and Mr. YOUNG.

Required: Entrance credit in Botany, or Biology 1; Chemistry 1; Art and Design 1.

2. MORPHOLOGY.—The general morphology and taxonomy of plants, including a study of selected types in each of the great divisions of the vegetable kingdom. Lectures or recitations and laboratory work, with occasional field excursions. *I.; daily; 6 and 7; (5).* Professor BURRILL and Mr. YOUNG.

Required: Entrance credit in Botany, or Biology 1; Art and Design 1.

In courses 1 and 2 taken together, either in the order of the numbers or the reverse, there is offered a comprehensive treatment of the subject, to serve the double purpose of an introduction to the science for those who desire to continue the study, and as a complete course for general students. Each semester's work is, however, independent, and may be separately credited.

3. CYTOLOGY AND PHYSIOLOGY.—Mostly laboratory work and assigned reading. The course extends through the year, but the work of each semester may be credited separately under the designations of 3a and 3b. The first semester is devoted mainly to cytology and histology, with special attention to technique; during the second

semester experimental physiology receives chief attention. *I. and II.; daily; 1 and 2; (5 each semester).* Professor BURRILL and Mr. YOUNG.

Required: Botany 1.

4. TAXONOMY OF SPECIAL GROUPS.—Mostly laboratory and herbarium work, and assigned reading. Field excusions are required. The course extends through the year, but the work of each semester may be credited separately under the designations of 4a and 4b. The first semester is devoted mainly to spermaphytes, the second to sporophytes. *I. and II.; daily; 1 and 2; (5 each semester).*

Required: Botany 2.

5. BACTERIOLOGY.—An introduction to the knowledge of the subject and instruction in methods. Only those who can give extra time when occasion demands it should make application. *II.; daily; 3 and 4; (5).* Professor BURRILL and Mr. YOUNG.

Required: Chemistry 1, and at least one semester's work in Biology, Botany, or Zoölogy, in the University.

6. BACTERIOLOGY FOR SANITARY ENGINEERS.—Bacteriological methods and their application in water analysis and sewerage. *I. (last seven weeks); daily; 3 and 4; (2).* Professor BURRILL and Mr. YOUNG.

7. PLANT PATHOLOGY.—Diseases and injuries of plants. Mostly laboratory, herbarium, and field work and assigned reading. *I.; M., W., F.; 1 and 2; (3).* Professor BURRILL and Mr. CLINTON.

Required: Botany 1, 2.

8. ECONOMIC BOTANY.—Useful plants and plant products. Lectures and assigned reading. *I.; Tu., Th.; 1 and 2; (2).* Professor BURRILL. [Not given in 1899-1900.]

9. INVESTIGATIONS AND THESIS.—Research work upon selected subjects. Special arrangements for this work should be made during the preceding year. *I. and II.; daily; arrange time; (5).* Professor BURRILL.

Required: Botany 1, 2, and at least one year from 3, 4, 5, 7.

10. SEMINARY.—Reports and discussions upon assigned topics and results of research work. For advanced and graduate students. *I. and II.; F.; arrange time; (1).* Professor BURRILL.

COURSES FOR GRADUATES

101. Biological Botany.
102. Systematic Botanv.
103. Bacteriology.
104. Evolution of Plants.

CHEMISTRY

1. Minor Course.—Elementary and Experimental Chemistry.—This course deals with the general principles of the science; the commoner elements only and their typical compounds are studied, and these are considered largely for the purpose of illustration.

The laboratory work comprises a series of such experiments, many of them quantitative, as serve best to illustrate the relations between the observed facts and the general principles, and to familiarize the student with the methods of chemistry. *Remsen's Introduction to Chemistry. I.; Lecture, M., Tu., W., F., 5; Laboratory, section A, M., W., F., 1 and 2; section B, M., W., F., 7 and 8; section C (engineers only), Tu., Th., 7 and 8; for engineers, (4); for all others, (5).* Professor Palmer, Assistant Professor Grindley, Mr. Sammis, and Mr. Sy.

2. Descriptive Inorganic Chemistry.—This course is required of all chemical students. It is mainly devoted to a study of the metallic elements, their classification, compounds, and chemical properties. The work is from lectures and assigned texts, without laboratory work. *Remsen's Advanced Course. II.; M., W., F.; 1; (3).* Assistant Professor Grindley.

Required: Chemistry 1.

2a. Inorganic Preparations.—This is a laboratory course designed to accompany the descriptive work of course 2. The work includes the precipitation, crystallization, and purification of various salts, the material being largely obtained from laboratory wastes. *Thorpe's Inorganic Chemical Preparations. II.; Tu., Th., S.; 3 and 4; (3).* Assistant Professor Grindley, and Mr. Sy.

Required: Chemistry 1.

3a. Qualitative Analysis.—This course includes a study of salts, their formation, solubilities, chemical reactions, etc. The periodic classification of the elements is made the basis for developing the principles of analysis. The work in the laboratory, after illustrating these principles, is occupied with the determination of basic and acid constituents of a given number of unknown substances. Analysis is also made of more complex substances, including natural and commercial products; and the work concludes with a comparative study of methods, difficult separations and problems in synthesis. *II.; Lecture, section A, Tu., Th., 5; section B, Tu., Th., 8; Laboratory, daily, section A, 3 and 4; section B, 6 and 7; (5).* Professor Parr, Assistant Professor Grindley, Mr. Sammis, and Mr. Sy.

Required: Chemistry 1.

3b. QUALITATIVE ANALYSIS, same as 3a, but requiring the first half of the *semester; (2½)*. Professor PARR, Assistant Professor GRINDLEY, Mr. SAMMIS, and Mr. SY.

Required: Chemistry 1.

4. ELEMENTS OF ORGANIC CHEMISTRY, MINOR.—A course in organic chemistry, provided more especially for students of agriculture and natural science. The instruction is directed mainly to the consideration of the general characteristics and the mutual relations of certain of the more important classes of carbon compounds, particularly the fats, the carbohydrates, and the proteids. *II. (last half); Lecture, M., W., F.. 3; Laboratory, Tu., Th., 3, 4, and 5; (2½).* Professor PALMER and Mr. SAMMIS.

Required: Chemistry 1, 3b.

5a. QUANTITATIVE ANALYSIS.—General principles and practice of gravimetric and volumetric analysis. This course is directed particularly to the general principles of quantitative analysis, including stoichiometry and the analysis of silicates. It is preliminary to all other courses in quantitative analysis. Lectures and assigned text from Fresenius, Cairns, and the journals. *I.; Lecture, M., W., 6; Laboratory, 10 periods a week, arrange time; (5).* Professor PARR and Mr. ROSE.

Required: Chemistry 3a.

5b. ANALYSIS OF VARIOUS INORGANIC SUBSTANCES, as clay, solids, ores, fertilizers, etc., etc. *II.; Lectures, Tu., 5; Laboratory, 6 or 12 periods a week; arrange time; (3 or 5).* Mr. ROSE.

Required: Chemistry 5a.

5c. EXAMINATION AND ANALYSIS OF FOODSTUFFS, as milk, butter, cereals, meats, etc. *II.; Lecture, Th., 5; Laboratory, 4 or 12 periods a week, arrange time; (2 or 5).* Assistant Professor GRINDLEY and Mr. ROSE.

Required: Chemistry 5a.

6a. CHEMICAL TECHNOLOGY.—This is a course of lectures comprising a study of technological chemistry as illustrated in those industries having a chemical basis for their principal operations and processes. Much use is made of the journals. *Thorpe's Industrial Chemistry* is used as a guide. No laboratory work. *II.; M., W.; 3; (2).* Professor PARR.

Required: Chemistry 3a.

6b. METALLURGY.—Special attention is given to the effect of impurities in ores upon metallurgical processes and finished products. Fuels, refractory materials, and fluxes are described and their value and application explained. A series of lantern slides illustrating actual plants in operation together with specimens of furnace material and products are used in illustration. Much use is made of journals, annuals, and monographs setting forth the best practice. *I.; M., W., F.; 3; (3).* Professor PARR.

Required: Chemistry 5a.

7. PHYSICAL ÇHEMISTRY.—A course in physical chemistry, including thermo-chemistry, consisting mainly of laboratory work. It comprises determinations of vapor density, specific heat, depression of freezing point, elevation of boiling point, electrical conductivity, etc., and calculation of molecular and atomic weights from the data thus obtained, and the use of calorimeter, polariscope, and other instruments, in determining such constants as serve in characterization or for quantitaive estimation of chemical substances, or which serve as the basis of theoretical generalizations. *I. or II.; arrange time; (3, 5, or 10).* Professor PALMER.

Required: Chemistry 2, 5a; Physics 1, 3.

8. IRON AND STEEL ANALYSIS.—Analyses are made of all the constituents by both rapid or technical and standard methods. The course also includes the analysis of furnace slags and a study of the methods for decomposing ores and refractory products. *II.; daily; arrange time; (5).* Professor PARR.

Required: Chemistry 5a.

9. ORGANIC CHEMISTRY.—The work of this course consists in the detailed discussion of the characteristics of several of the more typical and simple organic compounds, followed by the briefer consideration of most of the important classes of the derivatives of carbon. *Remsen's Organic Chemistry* is used as a text-book, and *Richter's Organic Chemistry* as a reference book. Must be accompanied by either 9a, 9b, or 9c. *II.; M., W., F.; 7; (3).* Professor PALMER and Mr. ROSE.

Required: Chemistry 2, 5a.

9a. ORGANIC SYNTHESIS.—Laboratory work for students of the chemical course, consisting of the preparation of the typical organic compounds. *II.; arrange time; (2).* Professor PALMER and Mr. ROSE.

9b. ORGANIC ANALYSIS.—Laboratory work for students of the chemical course, consisting of either ultimate organic analysis or proximate organic analysis, or both. *I.; Laboratory, 9 or 15 periods a week; arrange time; (3 or 5).* Professor PALMER and Mr. ROSE.

9c. Laboratory work in organic chemistry for students of the medical preparatory course. A few typical organic compounds are prepared, but the work consists mainly in a study of the chemical reactions and transformations of such organic substances as are especially involved in processes of nutrition or are used in medical practice. *II.; Laboratory, 6 or 15 periods a week; arrange time; (2 or 5).* Professor PALMER and Mr. ROSE.

10. SANITARY ANALYSIS.—The work consists in the examination and analysis of potable and mineral waters, air, etc. *I.; M., W., F., or daily; 3 and 4; (3 or 5).* Professor PALMER and Mr. ROSE.

Required: Chemistry 5a or 20.

11. INVESTIGATIONS AND THESIS.—Candidates for graduation from the chemical courses are required to devote at least three hours per day for one year to the investigation of some selected chemical subject, the results of which are to be embodied in a thesis. The subject must be determined upon by consultation with the professors of chemistry before the first Monday in November. Between that time and the end of the holiday recess an index to the bibliography of the subject must be prepared and presented to the professor in charge of the investigation. *I. and II.; 15 periods a week; arrange time; (5 each semester).* Professors PALMER and PARR, and Assistant Professor GRINDLEY.

Required: Chemistry, 30 hours.

12. THEORETICAL CHEMISTRY.—A course of instruction which includes discussions of the principles and theories of general chemistry. *Ostwald's Outlines of General Chemistry,* and *Nernst's Theoretical Chemistry. II.; M., W., F.; 2; (3).* Professor PALMER.

Required: Chemistry 2, 5a, and either 4 or 9.

13. AGRICULTURAL CHEMISTRY.—A course of lectures upon the chemical principles and processes involved in agriculture, taken conjointly with laboratory practice in analysis of agricultural products and materials. The work includes the quantitative separation and estimation of the constituents of agricultural products, analysis of fertilizers, soils, rain and drain waters, plants, foods, dairy products, etc. *Johnson's How Crops Grow and How Crops Feed; Storer's Chemistry in Its Applications to Agriculture. I. and II.; daily; 3; (5 each semester).* Assistant Professor GRINDLEY.

Required: Chemistry 3b, 4.

14. ORGANIC CHEMISTRY.—Lectures and reading upon special chapters of organic chemistry. *I.; Tu., Th.; 7; (2).* Professor PALMER and ....

Required: Chemistry 9.

15. (a) and (b) METALLURGICAL CHEMISTRY.—This course includes (a) the wet assay of copper, lead, zinc, and other ores, arsenical and complex as well as the simpler forms, also the analysis of finished metallurgical products; as, commercial lead, spelter, copper, etc.; during the last half of the term the work is occupied (b) with the fire assay of lead, gold, and silver ores. Fluxes, reagents, and charges are studied in connection with various typical ores and practice given in use of the crucible and muffle furnaces and in the manipulations connected with fire assaying. *I.; M., W., F.; 3, 4, and 5; (3).* Professor PARR and Mr. ROSE.

Required: Chemistry 5a.

15. (c) and (d) ELECTRO-CHEMICAL ANALYSIS.—A study (c) of methods and practice in quantitative determination by electrolytic separation and deposition of metals and compounds, and (d) a study of the methods employed in the electrolytic separation and refining of metals, treatment of ores, etc. The laboratory work involves practice in actual separations, a quantitative check being made on all results. *II.; M., W., F., or daily; 3, 4, and 5; (3 to 5).* Professor PARR and Mr. ROSE.

Required: Chemistry 5a.

16. CHEMISTRY FOR ENGINEERS.—This course is arranged particularly for mechanical engineers. It involves the proximate analysis of coals, determination of calorific power, technical analysis of furnace gases, examination of boiler waters, lubricating oils, etc. *II.; Lecture, F., 5; Laboratory, section B, Th., 3, 4, 5; F, 3, 4; section A, W.; 4, 5; Th., 3, 4, 5; (3).* Professor PARR.

Required: Chemistry 1.

17. INDUSTRIAL CHEMISTRY.—A laboratory course in the preparation of chemical products from raw materials. The manufacture and proving of pure chemicals, fractionation, and other processes of the manufacturing chemist. *II.; daily; Laboratory 15 periods a week, arrange time; (5).* Professor PARR.

Required: Chemistry 5a, 18.

18. SPECIAL ADVANCED COURSES—Special courses as indicated below, consisting mainly of laboratory work, may be arranged for those competent to pursue them. From 1 to 10 hours' credit will be allowed in the undergraduate courses for such work.

(a) Technical Gas Analysis, 1 hour to 3 hours.

(b) Metallurgical Chemistry, 3 hours to 10 hours.

(c) Chemistry of beet sugar industry, 2 hours to 10 hours. *Arrange time.* Professors PALMER and PARR.

19. SEMINARY.—Reports and discussions upon assigned topics from current chemical literature. One session each fortnight during the junior and senior years. *S.; (1).* Professor PALMER and Mr. ROSE.

20. QUANTITATIVE ANALYSIS.—An elementary course intended especially for such students of other departments as desire some training in the processes of quantitative analysis, but have not the time or the opportunity to enter the regular course in this subject. The work may vary in character, to some extent, according to the need of the individual student. *I. or II.; any two or four days; arrange time; (2 or 3).* Mr. ROSE.

21. PROXIMATE ORGANIC ANALYSIS.—The analysis and valuation of various commercial organic materials and products, including fats, oils, food stuffs, beverages, plants, drugs, medicines, nostrums, etc. *One or two semesters; Laboratory, 15 periods, arrange time; (5 or 10).* Professor PALMER and Mr. ROSE.

22a. PHOTOGRAPHY.—Offered especially for scientific students and others desiring a more thorough knowledge of photography than is offered in course 22b. This course is of special value to any intending to teach those branches in which the optical lantern is extensively used. The early part of the course is devoted to a general review of the methods and practices of photography, with sufficient laboratory work to make the student familiar with the same. Following this some time is devoted to the optical lantern, with sufficient practice on the part of the student to familiarize him with the manipulation of such apparatus. This is accompanied by instruction in the making and use of lantern slides. Instruction in photomicrography also has a place in this course, and students so desiring may pursue such work as far as time and the facilities of the department will allow. *I.; M., W., F.; 6 and 7; (2).* Professor PARR and Mr. WILDER.

Required: Chemistry 3a; Physics 1, 3.

22b. PHOTOGRAPHY.—Offered for engineering students and others who wish to obtain a general knowldege of photography. In this course the general subject is covered by lectures and laboratory work, the latter varying to some extent to suit the special line of work that the student expects to follow. *II.; M., W., F.; 6 and 7; (2).* Professor PARR and Mr. WILDER.

Required: Physics 1, 3; Chemistry 3b, unless otherwise arranged.

22c. REPRODUCTION OF DRAWINGS, ETC.—Provision is here made for a general course in the methods of reproduction made use of in the engineering professions. Blue-printing, black-printing, hectographing, and the other methods in use are explained by lectures and laboratory work. No distinct credit is given for such work, but the time so spent is deducted from that required in other courses, and so credited to the student doing the work. This work is offered to such students as may be required to do it as a part of some regular course, the time so spent to be determined by the instructor having such regular course in charge, and to students who elect it with approval of the proper authority. Mr. WILDER.

23. (a) and (b). HOUSEHOLD CHEMISTRY.—The first semester is largely devoted to practice in general analytical methods, both gravimetric and volumetric. The second is occupied chiefly with the examination of materials used in the household. Analyses are made of baking powders, vinegars, syrups, sugars, soaps, soap powders, wall papers, etc. *I. and II.; daily; 6 and 7; (5 each semester).* Professor PARR and Mr. ROSE.

Required: Chemistry 3a.

24. TOXICOLOGY.—Mainly laboratory work upon the detection and estimation of the more common poisons, organic and inorganic. *I. or II.; Laboratory 6 to 15 periods, arrange time; (2 to 5).* Professor PALMER and Mr. ——

Required: Chemistry 2, 3b, 5a, and either 4 or 9.

25. URINALYSIS.—Chemical and microscopic examination of urine. *I. or II.; Laboratory 6 periods, arrange time; (2).* Mr. ROSE.

Required: Chemistry 2, 3b, 5a.

COURSES FOR GRADUATES

101. ORGANIC CHEMISTRY.—Special investigations in the aliphatic or in the aromatic series.

102. INORGANIC CHEMISTRY.—Research work in general inorganic chemistry, including the critical and constructive study of methods of analysis, both quantitative and qualitative.

103. PHYSICAL CHEMISTRY.—Investigation of special problems, including also thermo-chemical research.

104. CHEMISTRY OF FOODS.—Investigations of the composition, fuel value, digestibility, and dietary value of foods and the chemical changes involved in cooking.

105. AGRICULTURAL CHEMISTRY.—Special investigations in the field of agricultural chemistry, including the chemistry of plants, foods, soils, and rain, drain and ground waters.

106. RESEARCH IN METALLURGICAL CHEMISTRY.—(a) Action of

solvents in extraction of gold and silver from their ores. (b) Methods of analysis of ores and products.

107. INVESTIGATION OF WATER SUPPLIES.—In connection with State Water Survey.

108. INVESTIGATION OF FUELS.—

(a) Heating power, calorimetric methods.

(b) Adaptation of bituminous coal to gas manufacture, purification of products.

(c) Coke and by-products.

109. SPECIAL PROBLEMS IN INDUSTRIAL CHEMISTRY.—

(a) Corrosion and scaling of steam boilers.

(b) Purification of feed waters.

(c) Cements and mortars.

(d) Paints and pigments.

CIVIL ENGINEERING

1. LAND SURVEYING.—Areas and distances by chain, compass, and plane table; U. S. public land surveys, including legal points involved in the reëstablishment of boundaries; magnetic variation and determination of true meridian. The students solve numerous problems in the field with instruments. *Bellows and Hodgman's Surveyor's Manual. I.; daily; 6 and 7; (5).* Associate Professor PENCE.

Required: General Engineering Drawing 1, 2; Math. 3.

2. TOPOGRAPHICAL DRAWING AND SURVEYING.—Topographical drawing is given during the bad weather of the first semester. During the second semester topographical surveying is taught, in which students solve problems with the plane table and the stadia, and make a topographical survey and plot the notes. This subject must be taken the first semester in connection with course 1 above, and the second semester in connection with course 3 below.

3. TRANSIT SURVEYING AND LEVELING.—Construction, adjustment, and use of the transit and level; angles, inaccessible distances, and areas with the transit; profiles and contours with the level. The instruments are in constant use by the students whenever the weather permits. In connection with this subject students may receive instruction in blue-printing, etc.; chemistry 22c. *Baker's Engineers' Surveying Instruments. II.; daily; 6 and 7; (5).* Associate Professor PENCE.

Required: Civil Engineering 1.

4. RAILROAD ENGINEERING.—In the field practice the class makes

preliminary and location surveys of a line of railroad of sufficient length to secure familiarity with the methods of actual practice. Each student makes a complete set of notes, maps, profiles, calculations, and estimates. *Godwin's Railroad Engineers' Field-Book, and Tratman's Track. I.; daily; 2, 3, 4; (5).* Associate Professor PENCE.

Required: Civil Engineering 1, 2, 3.

4a. RAILROAD ENGINEERING.—The first eleven weeks of course 4 are for students in municipal and sanitary engineering.

5. MASONRY CONSTRUCTION.—The students have experiments in the masonry laboratory, in testing cement, mortar, stone, and brick. *Baker's Masonry Construction. I.; M., Tu., W., Th., 1; Laboratory F, 6 and 7; (5).* Professor BAKER.

Required: Theoretical and Applied Mechanics 2; General Engineering Drawing 1, 2.

6. GEODESY.—Geodesy is taught by lectures and assigned reading. *II.; W.; 4 and 5; (1).* Professor BAKER.

Required: Math. 3; General Engineering Drawing 1, 2; Civil Engineering 1, 3; Descriptive Astronomy 4.

10. SURVEYING.—For students in the courses of architecture, architectural engineering, electrical engineering, and mechanical engineering. Areas with chain and compass, U. S. public land surveys, and principles of reëstablishing corners; use of transit in finding distances, areas, and in laying out buildings; use of the level in finding profiles and contours. *Baker's Engineers' Surveying Instruments. II.; M., Tu., W.; section A, 1 and 2; section B, 3 and 4; (3).* Associate Professor PENCE.

Required: Math. 4; General Engineering Drawing 1, 2; Physics, 1, 3.

12. BRIDGE ANALYSIS.—Instruction and practice are given in the computation of the stresses in the various forms of bridge trusses, by algebraic and graphical methods, under different conditions of loading. *Johnson's Modern Framed Structures. I.; daily; 2 and 3; (5).* Professor BAKER.

Required: Theoretical and Applied Mechanics 2; Architecture 5.

13. BRIDGE DETAILS.—The student makes a tracing of a shop drawing of a bridge, and then makes a critical report upon each element of the design and computes the cost. Afterward a comparative study is made of the several forms of details employed by leading designers. This must be taken with course 12 above during the first semester, and with course 14 below during the second semester.

Required: Civil Eng'g 12 and free-hand sketches, with dimensions, showing full details of a bridge measured by the student.

14. BRIDGE DESIGN.—Each student designs a bridge, proportioning the sections and working out the details, and afterward makes a complete set of drawings. *II.; daily; 1 and 2; (5).* Professor BAKER.

Required: Civil Engineering 12, 13.

15. TUNNELING.—This subject is given by lectures and assigned reading. Students are required to make written reports upon the methods employed in particular tunnels. Some time is given to practice in boring wells, dredging, quarrying, and sub-aqueous blasting. *II.; W.; 4 and 5; (1).* Professor BAKER.

Required: Math. 1, 3, 6; General Engineering Drawing 1, 2; Mechanical Engineering 1, 16, 17; Chemistry 1; Physics 1, 3.

16. ENGINEERING CONTRACTS AND SPECIFICATIONS.—A study is made of the fundamental principles of the law of contract, and of examples of the general and technical clauses of various kinds used in engineering specifications. *Johnson's Engineering Contracts and Specifications. II.; M., Tu.; 3; (2).* Professor BAKER.

Required: Civil Engineering 5, 12, 13; Municipal and Sanitary Engineering 2, 3.

17. RAILROAD STRUCTURES.—Instruction is given by lectures and references to standard authorities. Current practice is studied by the examination of existing structures and by means of a collection of the standard drawings of leading railroads. *II.; Th., F.; 3 and 4; (2).* Associate Professor PENCE.

Required: Civil Engineering 4.

COURSES FOR GRADUATES

All primary unless otherwise stated.

101. Location and Construction.
102. Railway Track and Structures, and their Maintenance.
103. Yards and Terminals.
104. Motive Power and Rolling Stock.
105. Signal Engineering.
106. Railway Operation and Management.
107. Bridge Designing.
108. Cantilever and Swing Bridges.
109. Metallic Arches.
110. Metallic Building Construction.
111. Roof Construction.

112. Stereotomy.

113. History of the Development of Bridge Building—Secondary.

128. Practical Astronomy.

129. Description of Work Done.

130. Critical Description of Engineering Construction.

131. Translation of Technical Engineering Work from French or German.

132. Any Primary in Theoretical and Applied Mechanics or Municipal and Sanitary Engineering.

133. Any Primary in Mathematics, Mechanical Engineering, or Electrical Engineering—Secondary.

134. Indexing of Civil Engineering Periodical Literature—Secondary.

DAIRY HUSBANDRY

1. Dairy Management.—Origin and development of the various breeds of dairy cattle; noted families and individuals in the different breeds; judging, best breeds for grading purposes; improvement of a herd by testing; care and selection; methods of management of a dairy herd; best feeds for the economical production of milk; construction and care of dairy barns. *I.; F.; 1; (1).* Mr. Fraser.

2. General Dairying.—Secretion of milk; its composition as determined by chemical analysis and by microscopic examination. General facts concerning bacteria in their special relation to milk, butter, and cheese. Methods of preventing contamination. Development of acid and the acid test. Pasteurization. Different methods of testing for fat contents, total solids, and adulterations. Variations in milk and their causes. Economic production of milk. Use and care of cream separators. Comparison of different systems of creaming and the making of butter by the most approved methods. *II., first half; 1 and 2; (2½).* Mr. Fraser.

3. Butter Making.—Operation of, and studies in efficiency of, different separators in comparison with gravity methods of creaming under a variety of conditions. Influence of character of milk and its handling upon the quality of butter. Different methods of ripening cream and the effect upon churning and upon butter, together with an extended practice in the manufacture and in scoring of butter. *II., second half; 1 and 2; (2½).* Mr. Fraser.

DRAWING, GENERAL ENGINEERING

1a. ELEMENTS OF DRAFTING.—Geometrical constructions; orthographic, isometric, and cabinet projections. *Tracy's Mechanical Drawing. I., first half; daily; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (2½).* Assistant Professor PHILLIPS and Mr. NEVINS.

1b. DESCRIPTIVE GEOMETRY.—Problems relating to the point, line, and plane. *Church's Descriptive Geometry. I., second half; daily; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (2½).* Assistant Professor PHILLIPS and Mr. NEVINS.

Required: Drawing, General Engineering 1a.

2a. DESCRIPTIVE GEOMETRY.—The generation and classification of lines and surfaces; planes tangent to surfaces of single and double curvature; intersections, developments, and revolutions. *Church's Descriptive Geometry. II.; Tu., Th.; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (2).* Assistant Professor PHILLIPS and Mr. NEVINS.

Required: Drawing, General Engineering 1a, 1b.

2b. LETTERING.—Plain and ornamental alphabets; free-hand and mechanical lettering; titles and title pages. *Jacoby's Plain Lettering. II., first half; M., W., F.; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (1½).* Assistant Professor PHILLIPS and Mr. NEVINS.

Required: Drawing, General Engineering 1a.

2c. SKETCHING AND PRACTICAL DRAWING.—Architectural sketch plans and details; bridge details; machines, machine parts, and mechanisms; working drawings; drawings finished in color and right line shading. Lectures on drafting instruments and materials; computing instruments; office methods, and reproduction processes. *Lectures and notes. II., second half; M., W., F.; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (1½).* Assistant Professor PHILLIPS and Mr. NEVINS.

Required: Drawing, General Engineering 1a, 1b.

3. ADVANCED DESCRIPTIVE GEOMETRY.—For students making a specialty of mathematics. Curved lines of the higher orders; higher single curved, warped, and double curved surfaces. *Church's Descriptive Geometry,* with references to *Warren's General Problems from the Orthographic Projections of Descriptive Geometry. II.; M., W., F.; arrange for two periods; (3).* Assistant Professor PHILLIPS.

Required: Drawing, General Engineering 1a, 1b, 2a.

ECONOMICS

1. Introductory Course.—This is a beginners' course, consisting of two parts:

a. Principles of Economics.—This course is introductory to the more advanced courses. Attention is confined to the underlying principles of the science. *I.; M., W., F.; 5; (3).* Dr. Hammond.

b. English Economic History.—In this course the economic development of a great commercial and industrial nation is traced from its primitive stages to the present time. The relations are traced between this historic development and the principles discussed in course *a*. This course should accompany course *a*, and is required of all students in the political science group. *I.; Tu., Th.; 5; (2).* Dr. Hammond.

2. Principles of Economics.—This is a course in general economics offered primarily to junior and senior students of high standing in the colleges of agriculture, engineering, and science. Emphasis is laid on the practical side of economic questions. *II.; M., W.; 7; (2).* Professor Kinley.

Required: Two years of University work.

3. Money and Banking.—In this course a study of the history and functions of money is followed by a study of the monetary and banking history of the United States and of such topics as the theory of prices, credit, government paper, the money market, etc. *II.; M., W., F.; 5; (3).* Professor Kinley.

Required: Economics 1 or 2.

4. Financial History of the United States.—This course begins with Hamilton's administration of the Treasury. It deals with the growth and management of the national debt, and with the industrial expansion and the tariff history of the country. *I. and II.; Tu., Th.; 5; (2).* Professor Kinley.

Required: Economics 1 or 2.

5. Public Finance.—This course consists of a critical comparative study of financial theories and methods. Especial attention is directed to American conditions. Public expenditure and its relation to the various sources of revenue; taxation, its theory, incidence, and methods; public debts, financial administration, and budgetary legislation, are among the subjects discussed. *II.; M., W., F.; 1; (3).* Dr. Hammond.

Required: Economics 1 or 2.

6. TAXATION.—This course gives a more detailed treatment of the problems of American taxation than is possible in course 5. The reports of state tax commissioners are reviewed and criticised, and an attempt is made to develop a system of taxation that shall meet the requirements of our state and local governments. Lectures, reports, and discussions. *II.; M., W.; 7; (2).* Dr. HAMMOND.

Required: Economics 1 or 2 and must be preceded or accompanied by Economics 5. [Not given in 1899-1900.]

7. THE TARIFF PROBLEM.—This course deals briefly with the various protection theories, and with the history of the tariffs of the U. S. and their influence upon the social and industrial development of the country. Lectures, assigned readings, and discussions. *I.; W., F.; 1; (2).* Dr. HAMMOND.

Required: Economics 1 or 2. This course or course 9 will be given, as applicants prefer.

8. THE TRANSPORTATION PROBLEM.—This course deals with the problems of transportation, especially by railways, in their economic and social aspects. A comparative study is made of the development, management, and regulation of railways in Europe and the United States. Special attention is given to the problem of rate-making. Lectures, reports, and discussions. *II.; M., W.; 7; (2).* Dr. HAMMOND.

Required: Economics 1 or 2. The course is open without the requirement in economics to students in the College of Engineering who have taken Civil Engineering 4.

9. AGRICULTURAL PROBLEMS.—This course includes a discussion of the economic principles underlying the science of agriculture, a short history of the development of agriculture in this country, and a study of the problems and tendencies of American farming. Lectures and quizzes. *I.; W., F.; 1; (2).* Dr. HAMMOND.

Required: Economics 1 or 2.

10. ECONOMICS OF AGRICULTURE.—This is a ten weeks' course especially prepared for the students of the Winter School in Agriculture (see p. 138). The first part of the course is devoted to a study of the elements of economics, and the second part is given up to a discussion of some of the present day problems of American agriculture. *M., W., F., arrange.* Dr. HAMMOND.

11. STATISTICS.—A short course recommended to all who intend to take the advanced courses in economics. It is of a practical character, and is intended to furnish a knowledge of the statistical method, its limitations and abuses, and to enable the student to use intelligently

government reports, statistical publications, trade papers, etc. Lectures, reports, and discussions. *II.; Tu. Th.; 3; (2).* Dr. HAMMOND.

Required: Economics 1a or 2.

12. THE LABOR PROBLEM.—This course is a study of the labor movement and its social significance. Readings, lectures, and quizzes. *I.; M., W., F.; 5; (3).* Professor KINLEY.

Required: Economics 1 or 2.

13. THEORIES OF PRODUCTION AND CONSUMPTION.—This course is a study of the conditions of social prosperity as dependent on production and consumption. *I.; Tu., Th.; 7; (2).* Professor KINLEY.

Required: 10 hours in Economics.

14. DISTRIBUTION.—This course deals with the problem of distribution of wealth both in theory and practice. It includes a discussion of private property, of socialism and communism, and of sundry proposals, like the single-tax, for correcting the inequalities of wealth without fundamental changes in the structure of society. *I. and II.; Tu., Th.; 5; (2).* Professor KINLEY.

Required: 10 hours in economics; or, economics 1 or 2, and either Anthropology 1, or Public Law 1. [Not given in 1899-1900.]

15. PROBLEMS OF PAUPERISM AND CRIME.—This course begins with the history of poor relief in Europe and the United States. As full a discussion of the various methods of reform and prevention is given as the time will permit. *II.; Tu., Th.; 2; (2).* Dr. HAMMOND.

16. SOCIAL INSTITUTIONS.—This course includes a study of the more common forms of social groups, such as the family, the horde, the tribe, and the state. The structure and the development of these societies are discussed in the light of the principles presented in course 17. *II.; Tu., Th.; 2; (2).* Dr. HAMMOND.

Required: Economics 17. [Not given in 1899-1900.]

17. SOCIOLOGY.—An elementary presentation of social principles and phenomena, and a brief discussion of some of the recent theories advanced to explain the growth and structure of society. *I.; Tu., Th.; 2; (2).* Dr. HAMMOND.

18. THE MONOPOLY PROBLEM.—This is a study of the economic aspects of monopoly, the limits of competition, and the relation of monopoly to the public welfare. *I.; M., W., F.; 5; (3).* Professor KINLEY.

Required: Economics 1 or 2. [Not given in 1899-1900.]

19. ECONOMIC SEMINARY.—Advanced students will be formed

into a seminary for investigation and for the study of current economic literature. Students who write their theses in economics must do so in connection with the seminary work. *I. and II.; arrange time; (7 for the year).* Professor KINLEY and Dr. HAMMOND.

COURSES PRIMARILY FOR GRADUATES

(These courses are open to students who have had one full year's work in economics.)

101. The Theory of Value.—This is an historical and critical study of theories of value.

102. The History of Economic Thought.—In this course portions of the works of economic writers since the 16th century are read. Lectures are given tracing the course of economic thought in its relation to the prevalent philosophy.

ELECTRICAL ENGINEERING

1. ELECTRICAL ENGINEERING.—A course of lectures with laboratory practice, intended for students in mechanical and architectural engineering and for others who require only the elements of dynamo-electric machinery and an outline of the industrial applications of electric power. *II.; Lecture, Tu., F., 1, Laboratory; section A, Th., 6, 7, 8; section B, F., 6, 7, 8; (3).* Assistant Professor BROWNE.

Required: Physics 1, 3; Mathematics 9.

2. DYNAMO-ELECTRIC MACHINERY.—Lectures on the theory of dynamo-electric machinery, particularly continuous current machines; theory and use of instruments used in dynamo testing. This course is a continuation of Electrical Engineering 11, begun the second semester of the third year. *I.; M., W., F.; 6; (3).* Assistant Professor BROWNE.

Required: Physics 4; Electrical Engineering 11.

3. DYNAMO-ELECTRIC MACHINERY.—Laboratory practice. Experimental study of continuous current dynamos, motors, and accessory apparatus. Includes such complete tests as are made in the testing laboratories of our best manufactories. *I.; section A, M., Th., 3, 4, 5; section B, Tu., Th. 3, 4, 5; (2).* Assistant Professor BROWNE.

Required: Physics 4; Electrical Engineering 11.

4. DESIGN OF ELECTRO MAGNETS AND CONTINUOUS CURRENT MACHINERY.—Drafting with supplementary lectures on the design and construction of electro-magnetic mechanisms, and dynamo-electric machines. Each student calculates, designs, and makes detailed draw-

ings of typical examples of this apparatus. *I.; Lecture, Tu., Th., 6; Design, W., 3, 4, 5; (3).* Associate Professor Esty.

Required: Physics 4; Electrical Engineering 11.

5. Photometry.—Lectures and laboratory. A study of the principles of photometry, with candle power, life, and efficiency tests of arc and incandescent lamps. *I.; Lecture, S., 2; Laboratory, arrange 3 periods; (3).* Assistant Professor Browne.

Required: Physics 4.

6. Telegraphy and Telephony.—Lectures and practice. This course includes methods of telegraphy, the theory of the telephone, and telephone engineering with special reference to the construction, testing and protection of lines. Visits to the local telephone exchanges are made, and reports on the systems required. *I.; first nine weeks; Lecture, M., W., F.; 2; (1½).* Associate Professor Esty.

Required: Physics 4.

7. Electrolysis and Electro-Metallurgy.—Lectures and laboratory. The commercial applications of electrolysis in refining metals; treatment of sewage, etc.; electrotyping; electro-plating. A short course in electro-chemistry is included. Elective for year 1900-1901. *I,; arrange time; (2).* Assistant Professor Browne.

Required: Chemistry 1; Physics 4.

8. Electric Wiring and Distribution.—Lectures and practice. In this course are studied methods of electrical distribution for lighting and power, the design of circuits, interior wiring, fire insurance rules and regulations, methods of localizing faults in distributing mains with tests on the University electric distributing system. *I., last 9 weeks; M., W., F.; 2; (1½).* Associate Professor Esty.

Required: Electrical Engineering 11; Physics 4.

9. Electric Lighting and Central Stations.—Lectures and drafting. This course is a continuation of the preceding, and is supplementary thereto. It includes the design, operation, and economical management of central stations; the use of accumulators, compensators, and other regulators; plant testing; cost of producing electrical energy; consulting engineering. Plans, specifications, and estimates are made by each student for a complete plant. *II., first 7 weeks; Lecture, M., F.. 1; Design, M., F., 2, 3, 4; (1½).* Associate Professor Esty.

Required: Electrical Engineering 2, 3, 4, 5, and 8.

10. Seminary.—A weekly meeting of instructors and students is held in the department reading room for discussion of topics from the current journals of theoretical and applied electricity. Papers on

any original work being done in the department are read and discussed. A card catalogue of references to the leading electrical journals is maintained by the coöperation of members of the seminary with the department. *I. and II.; Tu.; 7 and 8; (1).* Associate Professor Esty.

11. Elements of Dynamo-Electric Machinery.—A course of lectures introductory to the fuller courses of the fourth year. *II.; Tu., Th.; 6; (2).* Assistant Professor Browne.

Required: Physics 4 one semester.

12. Alternating Currents and Alternating Current Machinery.—Lectures on the theory and application of alternating electric currents. *II.; M., W., F.; 6; (3).* Assistant Professor Browne.

Required: Electrical Engineering *2, 3.*

13. Alternating Currents and Alternating Current Machinery.—Laboratory practice. Experimental study of alternating current instruments and apparatus, including single-phase and polyphase alternators, motors, and transformers. The University electric lighting plant is available for complete plant tests. *I.; section A, M., 7, 8, 9, and Th., 2, 3, 4; section B, Tu. and S., 2, 3, 4; (2).* Assistant Professor Browne.

Required: Electrical Engineering 2, 3.

14. Design of Alternating Current Machinery.—Lectures and drafting. Design and construction of alternators, motors, and transformers. Typical examples of this apparatus are studied and designed, and detailed drawings made. *II.; Lecture, Tu., Th., 6; Design, W., 2, 3, 4; (3).* Associate Professor Esty.

Required: Electrical Engineering 2, 3, 4.

15. Electrical Transmission of Power.—Lectures and drafting. The design, equipment, and operation of electric railways and power stations; the utilization of water power and long distance transmission of electric power; the application of electric motors to general power distribution; consulting engineering. Visits to the plant of the local light and power company, and a detailed study of the University lighting and power plant form a part of the instruction, and full written reports of the installations are required. *II., last 11 weeks; Lecture, M., W., F., 1; Design, M., F., 2, 3, 4; (3).* Associate Professor Esty.

Required: Electrical Engineering 2, 3, 8, 9.

COURSES FOR GRADUATES

Primary

101. Mathematical Theory of Electricity and Magnetism.
102. Absolute Measurements in Electricity and Magnetism.
103. Dynamo Electric Machinery.
104. Electrical Transmission of Power.
105. Electro-Metallurgy.
106. Photometry.
107. Electrical Design.
108. Economy of Production and Utilization of Electrical Energy.
109. Consulting Engineering.

Secondary

110. Mathematics.
111. Physics.
112. Language.
113. Chemistry.
114. Architectural Engineering.
115. Civil Engineering.
116. Municipal and Sanitary Engineering.
117. Mechanical Engineering.
118. Translation of Technical Engineering Works.
119. Calorimetry.

ENGLISH LANGUAGE AND LITERATURE

1. GENERAL SURVEY OF ENGLISH LITERATURE.—*I.; daily; section A, 2; section B, 4; section C, 7; (5).* Professor DODGE and Associate Professor JAYNE.

2. PROSE WRITERS OF THE EIGHTEENTH AND NINETEENTH CENTURIES.—*II.; daily; section A, 2; section B, 7; (5).* Professor DODGE and Associate Professor JAYNE.

Required: English 1.

3. NINETEENTH CENTURY POETRY.—*I. and II.; M., W., F.; 3; (3 each semester).* Associate Professor JAYNE.

Required: English 1.

4. PROSE WRITERS OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.—*I. and II.; Tu., Th.; 3; (2 each semester).* Professor DODGE.

Required: English 1 and 2. [Not given in 1899-1900.]

4a. NON-DRAMATIC POETRY OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.—*I. and II.; Tu., Th.; 3; (2 each semester). Professor* DODGE.

Required: English 1 and 2.

5. SHAKSPERE AND HISTORY OF THE DRAMA.—Primarily for graduates. *I. and II.; M., W., F.; 2; (3 each semester).* Professor DODGE.

Required: English 1, 2 and either 3 or 4.

6. HISTORY OF ENGLISH CRITICISM.—Primarily for graduates. *I. and II.; Tu., Th.; 4; (2 each semester).* Professor DODGE.

Required: English 1, 2 and either 3 or 4.

7. SEMINARY: ENGLISH FICTION.—Open only to senior and graduate student. *I. and II.; Tu.; arrange time; (1).* Associate Professor JAYNE.

8. OLD ENGLISH (ANGLO-SAXON) GRAMMAR AND PROSE.—*I. and II.; M., W., F.; arrange time; (3 each semester).* Professor DODGE.

9. EARLY ENGLISH.—*I. and II.; Tu., Th.; arrange time; (2 each semester).* Professor DODGE.

10. OLD ENGLISH POETRY.—*I. and II.; M., W., F.; arrange time; (3 each semester).* Professor DODGE.

Required: English 8 and 9.

11. FOURTEENTH AND FIFTEENTH CENTURY LITERATURE.—*I. and II.; Tu., Th.; arrange time; (2 each semester).* Professor DODGE.

Required: English 8 and 9.

12. HISTORY OF THE ENGLISH LANGUAGE.—*I. and II.; W.; arrange time; (2 each semester).* Professor DODGE.

Required: English 8 and 9.

13. ICELANDIC.—*I. and II.; daily; arrange time; (5 each semester).* Professor DODGE.

Required: English 8 and 9, or German 1.

14. OLD ENGLISH LEGAL CODES.—Special course for students of politics, economics, and history. As an introduction to the course, Old English Grammar is studied, so far as is necessary for a proper understanding of early phraseology. Primarily for graduates, but open to undergraduates having sufficient preparation. *I. and II.; M., W.; arrange time; (2 each semester).* Professor DODGE.

Required: One year of history, economics, sociology, or English Literature.

15. SEMINARY: METHODS OF ENGLISH TEACHING.—Open to senior and graduate students. *I. and II.; W.; arrange time; (1 each semester.).* Professor DODGE and Associate Professor JAYNE.

FRENCH

1. ELEMENTARY COURSE.—This course embraces grammatical study, pronunciation, exercises in composition, and conversation. Reading of representative works of modern authors, such as Daudet, Labiche, Jules Verne, and others. *I. and II.; daily; section A, 1; section B, 3; (5 each semester).* Assistant Professor PIATT.

2. NINETEENTH CENTURY.—(1) The class will read works of Mérimée, George Sand, Balzac, Sandeau, Bourget, Hugo, and others. (2) Outlines of French literature. (3) Assigned readings and reports thereon. *I. and II.; daily; 1; (5 each semester).* Assistant Professor FAIRFIELD.

Required: French 1 or 5.

3. SEVENTEENTH CENTURY.—(1) Readings from Molière, Corneille, Racine, Lafontaine, Boileau, de Sévigné, and others. (2) Study of French literature and civilization of the century. (3) Advanced composition. (4) Assigned reading. *I. and II.; daily; 6; (2 each semester).* Assistant Professor FAIRFIELD.

Required: French 2.

4. EIGHTEENTH CENTURY.—(1) The course will consist of lectures in French, themes, and collateral reading. Reading of selected works of Voltaire, Montesquieu, Rosseau, Chénier, and Beaumarchais. (2) Assigned readings. (3) Themes in French upon subjects connected with the course. *I. and II.; M., W., F.; 3; (5 each semester).* Assistant Professor FAIRFIELD.

Required: French 3.

5. SCIENTIFIC AND TECHNICAL FRENCH.—Similar to course 1 for first semester. In the second semester the class takes up the study of scientific and technical French. For this purpose a weekly scientific periodical, *La Nature,* published at Paris, is taken by each member, and made the basis of the class-room work. Particular attention is given to acquiring a technical vocabulary and to rapid reading. *I. and II.; daily; section A, 2; section B, 7; (5 each semester).* Assistant Professor PIATT.

COURSE FOR GRADUATES

101. OLD FRENCH READINGS.—Clédat, Les Auteurs Français du Moyen Age; Suchier, Aucassin et Nicolete; Gautier, La Chanson de Roland. Translation and comparison with the modern idiom. Study of the laws of phonetic changes. Lectures upon Old French philology. Assistant Professor FAIRFIELD.

GEOLOGY

1. Geology, Major Course.—(a) Dynamic Geology. The instruction given under this head is intended to familiarize the student with the forces now at work upon and within the earth's crust, modeling its reliefs, producing changes in the structure and composition of its rock masses and making deposits of minerals and ores. A series of localities is studied in which great surface changes have recently taken place, with a view to ascertaining the character of the forces producing such changes, and the physical evidence of the action of like forces in the past. The subject is taught by lectures, and is abundantly illustrated by maps, models, charts, and views.

(b) Petrographic. This course is a continuation of Mineralogy 16 (p. 228), and deals with fragmental rocks in substantially the same manner as that does with crystallines.

(c) Historical Geology. The work on this subject is substantially an introduction to the history of geology as a science. So far as may be done with the data in hand, an attempt is also made to trace the history of each geological period.

(d) Paleontology. The scheme of instruction in this subject places before the student the classification adopted for those organic forms occurring as fossils, together with the succession of the various groups that occur in the strata, with the cause, as far as known, for their appearance and disappearance. The student is required to familiarize himself with selected groups of paleozoic fossils, abundant illustrations of which are placed in his hands. The subject is presented in lectures and demonstrations, each group being considered in connection with its nearest living representative. *II.; daily; 1 and 2; (5).*

(e) Economic Geology. The final term of this course is devoted to a study of the uses man may make of geologic materials, the conditions under which these materials occur, and the qualities which render them valuable. The instruction is given by text and readings from the various state and government reports, transactions of societies, and monographs in which these subjects are treated, as well as by demonstrations with materials from the collections of the University. (14 weeks, 10 hours per week.)

In dynamic and historical geology Dana's manual is used as a reference book, and in economic geology Tarr's Economic Geology of the United States. Petrography is pursued by means of a laboratory guide adapted from Rosenbusch, Zirkel, Roth, Teall, and others.

In economic geology the manuals of Kemp and Tarr are used as texts. In paleontology Nicholson, Bernard, and Zittel are used for descriptions of the larger groups, Miller for general distribution, and the various state surveys for species. *I.; daily; 6 and 7; (5).* Professor ROLFE and Mr. HUBBARD.

Required: Mineralogy 1.

2. INVESTIGATIONS AND THESIS.—For students who select a geological thesis, guidance and facilities will be offered for individual investigations in the field and laboratory. *I. and II.; daily; 3 and 4; (5 each semester).* Professor ROLFE.

Required: Geology 1.

3. GENERAL GEOLOGY, MINOR COURSE.—This course includes a selection of such geological facts and theories as should be known to every intelligent person, with such discussion of them as the time will permit. The subjects treated will be fully illustrated. One hour each day will be devoted to laboratory work, and this time will be about equally divided between the study of minerals, rocks, and fossils.

The instruction will be by texts and lectures, using Le Conte's Elements of Geology as the basis for the class-room work, and a specially prepared guide for the laboratory. *II.; daily; 6 and 7; (5).* Professor ROLFE and Mr. HUBBARD.

NOTE.—Geology 1a, b, c. d may be taken, instead of the minor, by those who have had Mineralogy 1.

COURSES FOR GRADUATES

101. PALEONTOLOGY.—A critical and comparative study of the fossils found in the rocks of Illinois.

102. ECONOMIC GEOLOGY.—The effects which variations in the chemical composition and physical constitution of inorganic substances used in the arts have on the qualities of the manufactured product, and should have on methods of manufacture. A critical examination of the tests now employed in determining the qualities of building stones.

103. ILLINOIS GEOLOGY.—Glacial geology in relation to water supply of drift-covered regions. Dynamic and stratigraphic geology of the Ozark uplift in Illinois.

GERMAN

[For Courses A and B, see p. 272.]

1. ELEMENTARY COURSE.—Thomas's Practical German Grammar; Super's German Reader; Storm's Immensee with Hatfield's

Composition, based on Immensee, or other easy narrative prose. *I.; daily; section A, 1; section B, 2; section C, 3; section D, 4; section C, 7; (5).* Mr. MEYER and Dr. BROOKS.

2. ENGINEERING COURSE.—For students in the College of Engineering. General descriptive prose, followed by the translation of articles dealing with physics or the history of architecture. *II.; daily; 2; (5).* Dr. BROOKS.

Required: German 1.

3. NARRATIVE PROSE AND MODERN DIALOGUE.—For students in the College of Literature and Arts, and in the College of Science. Bernhardt's Novelletten Bibliothek; Freytag's Journalisten, or other works of a similar character. Harris's Prose Composition. *II.; daily; section A, 2; section B, 7; (5).* Mr. MEYER and Dr. BROOKS.

Required: German 1.

4. DESCRIPTIVE AND HISTORICAL PROSE.—Selections from standard prose writers of the present century, with grammatical review and drill; also exercises in reading at sight. *I.; daily; section A, 1; section B, 3; section C, 6; (5).* Professor RHOADES, Mr. MEYER, and Dr. BROOKS.

Required: German 1 and 3, or two years of high school work.

5. GERMAN CLASSICS.—One of Schiller's later dramas and one of Goethe's or Lessing's are translated with work in prose composition. *II.; daily; section A, 3; section B, 6; (5).* Professor RHOADES and Mr. MEYER.

Required: German 4.

6. SCIENTIFIC READING.—Required course for students in the College of Science and in the College of Engineering who offer two years of German for entrance. Works in physico-mathematical and in biological and chemical science are translated. *II.; daily; section A, 1; section B, 4; (5).* Dr. BROOKS.

Required: German 4.

7. LESSING OR SCHILLER, SELECTIONS.—The authors will be studied in alternate years; in 1899-1900, study of Lessing, designated as 7a; in 1900-1901, study of Schiller, designated as 7b. Students may, if they desire, elect and receive credits for both options. *I.; M., W., F.,; 7; (3).* Professor RHOADES.

Required: German 5 or 6, or three years of high school work.

8. SELECTIONS FROM LESSING OR SCHILLER.—The work is designed to supplement course 7, but with the approval of the instructor may be taken separately. The same arrangement will be followed

as in course 7, the work being designated as 8a and 8b. *I.; Tu., Th.; 7; (2).* Professor RHOADES.

Required: German 5.

9. GOETHE.—Translation and discussion of selected work. In 1899-1900, selections from his lyrics, prose works, and classical dramas, designated as 9a; in 1900-1901, study of Faust, designated as 9b. Students may elect and receive credit for both options. *I.; M., W., F.; 8; (3).* Professor RHOADES.

Required: German 7.

10. LECTURES ON GOETHE.—The work is designed to supplement and accompany course 9. *I.; Tu., Th.; 8; (2).* Professor RHOADES.

11. HISTORY OF GERMAN LITERATURE.—Lectures and assigned collateral reading. *II.; Tu., Th.; 7; (2).* Professor RHOADES.

Required: German 7.

12. HEYNE AND THE ROMANTIC POETS.—Translations and assigned readings. *II.; M., W., F.; 8; (3).* Professor RHOADES.

Required: German 5.

13. TEACHERS' SEMINARY.—Study of methods, text-books, and practical teaching. This course will be required in order to obtain a specific recommendation to teach German. *II.; Tu., Th.; 8; (2).* Professor RHOADES.

Required: German 7 and 12, also 11 unless taken in connection with this course.

GREEK

1. XENOPHON.—Lesser writings. Greek prose composition once a week. *I.; daily; 4; (5).* Professor MOSS.

2. HISTORICAL PROSE.—Selections from Herodotus, Thucydides, and Xenophon. Greek prose composition once a week. *II.; daily; 4; (5).* Professor MOSS.

Required: Greek 1.

3. PLATO.—The lesser dialogues. *I.; daily; 1; (5).* Professor MOSS.

Required: Greek 2.

4. GREEK TRAGEDY.—*II.; daily; 1; (5).* Professor MOSS.

Required: Greek 3.

5. HOMER.—The Odyssey. *I.; M., W., F.; 3; (3).* Professor MOSS.

Required: Greek 4.

6. HOMER.—The Odyssey. *II.; M., W., F.; 2; (3).* Professor MOSS.

Required: Greek 4.

7. ISOCRATES.—The Panegyricus. Demosthenes. The private orations. *I.; Tu., Th., 2; (2).* Professor MOSS.

Required: Greek 4.

8. LUCIAN.—Select dialogues. *II.; Tu., Th.; 2; (2).* Professor MOSS.

Required: Greek 4.

HISTORY

1. MEDIÆVAL AND MODERN EUROPEAN HISTORY.—Elementary, introductory course. *I. and II.; M., W., F.; 7; (3).* Professor GREEN and Mr. SCHOOLCRAFT.

2. HISTORICAL INTRODUCTION TO CONTEMPORARY POLITICS.—The political history of the nineteenth century. The first semester is devoted to the political history of the United States, and the second to that of Europe. The work of either semester may be taken separately. This course, taken with Public Law and Administration 1, constitutes, during the first semester, a course in American history and government; and in the second semester a course in the governments and recent political history of Europe. *I. or II.; Tu., Th.; 7; (2 each semester).* Professor GREENE.

3. AMERICAN HISTORY.—The origin and growth of the nation from the beginning of English colonization in America to the close of the reconstruction period. *I. or II.; Tu., Th.; 1; (2 each semester).* Professor GREENE.

Required: History 1 or 2; or, for juniors and seniors in the Colleges of Engineering, Science. and Agriculture, any course in economics or public law and administration.

4. ENGLISH CONSTITUTIONAL HISTORY.—In this study of the growth of the English constitution, some attention is also given to the origins of legal institutions. The course is therefore adapted to the needs of students who expect to follow the profession of law. *I. and II.; M., W., F.; 3; (3 each semester).* Mr. SCHOOLCRAFT.

Required: History 1 or an equivalent.

5. THE HISTORY OF GREECE.—This course and History 6 will be useful to students who expect to teach the classics or ancient history in secondary schools. *I.; M., W., F.; 1; (3).* Mr. SCHOOLCRAFT. [This course may be omitted in 1899-1900.]

6. THE HISTORY OF ROME.—The aim of this course, which furnishes a suitable introduction to History 1, is to give a general survey of the Roman world before the appearance of the Germans, rather than to trace the economic and political history of the city. *II.; M.,*

W., F.; 1; (3). Mr. SCHOOLCRAFT. [This course may be omitted in 1899-1900.]

7. THE REVOLUTIONARY ERA IN EUROPE, 1763-1815.—*I.; M., W., F.; 6; (3).* Professor GREENE.

Required: History 1.

8. THE COLONIAL INTERESTS AND COLONIAL POLICIES OF THE EUROPEAN POWERS.—Special attention will be given to the eighteenth and nineteenth centuries. *II.; M., W., F.; 6; (3).* Professor GREENE.

Required: History 1.

9. MEDIÆVAL HISTORY.—Advanced course. The conflict of the Papacy and the Empire. *I.; M., W., F.; 2; (3).* Mr. SCHOOLCRAFT.

Required: History 1.

10. ENGLAND UNDER THE STUART KINGS.—Puritanism and the Church of England. The conflict between king and parliament. *II.; M., W., F.; 2; (3).* Mr. SCHOOLCRAFT.

11. SEMINARY IN AMERICAN HISTORY.—Training in the use of the sources. Two hours a week throughout the year. Arrange hours. Professor GREENE.

Required: History 3.

12. SEMINARY IN ENGLISH HISTORY.—The general subject for the year 1899-1900 will be the Long Parliament. Two hours a week throughout the year. *Arrange hours.* Mr. SCHOOLCRAFT.

Required: History 1 and at least one other course in history.

COURSES FOR GRADUATES

101. AMERICAN HISTORY.—Special studies in the development of the West.

102. MEDIÆVAL HISTORY.—[See the announcement of courses in Law for the Seminary in Legal History, p. 152.]

HORTICULTURE

1. ORCHARDING AND GRAPE CULTURE.—Comprising a study of pomaceous fruits: apple, pear, quince. Drupaceous or stone fruits: plum, cherry, peach and nectarine, apricot. The grape.

Each fruit is studied with reference to the following: Botanical matter, history, importance and extent of cultivation, soil, location, propagation, planting, pruning and training, fertilizers, spraying, insect enemies and diseases, varieties, harvesting, storing and marketing, profits. *I.; M., W., F.; 2; (3).* Assistant Professor BLAIR.

2. PLANT PROPAGATION AND SMALL FRUITS.—(a) Methods of securing and perpetuating desirable varieties by self- and cross-fertilization, or by hybridization, and selection. Propagation of plants by seeds, cutting, layering, grafting, budding, etc.

(b) The strawberry, raspberry, blackberry, dewberry, currant, gooseberry, cranberry, and juneberry; each studied with reference to the points enumerated under 1, above. *II.; M., W., F.; 3 first half and 4 second half; (3).* Assistant Professor BLAIR.

Courses 1 and 2 are intended to give a general idea of horticultural work such as all students in the College of Agriculture should have, and at the same time to prepare those who wish it for more advanced work.

3. VEGETABLE GARDENING.—Kitchen and market gardening and vegetable forcing, embracing a study of all the commoner vegetables. *II.; M., W., F.; 6; (3).* Assistant Professor BLAIR.

4. FORESTRY.—This course embraces a study of forest trees and their natural uses, their distribution, and their artificial production. The relations of forest and climate are studied, and the general topics of forestry legislation and economy are discussed. *II.; Tu., Th.; 5; (2).* Professor BURRILL.

5. LANDSCAPE GARDENING.—Ornamental and Landscape gardening, with special reference to the beautifying of home surroundings. The subject is treated as a fine art, and is illustrated by the use of lantern slides and charts. *II.; M., W., F.; 1; (3).* Assistant Professor BLAIR.

6. ECONOMIC BOTANY.—See Botany 8 for description of this course.

7. SPECIAL INVESTIGATION AND THESIS WORK.—For graduates and advanced students. *I. and II.; arrange time; (10).* Professor BURRILL and Assistant Professor BLAIR.

COURSES FOR GRADUATES

101. Studies in combating fungous, insect, and other enemies of plants, including spraying materials and methods.

102. Studies in plant breeding, hybridization, and self- and cross-fertilization.

ITALIAN

1. GRAMMAR AND READING.—Grandgent's Italian Grammar, reading of modern authors; Dante's Divina Commedia, outlines of Italian literature. *I. and II.; M., W., F.; arrange time; (5).* Assistant Professor FAIRFIELD.

LATIN

1. CICERO AND PLINY.—De Amicitia and De Senectute; composition based on the text; selections from Pliny's Letters. Roman life in Pliny's time. This course is required of students who offer but nine credits in Latin for admission. *I. and II.; daily; 2; (5 each semester).* Professor BARTON.

2. LIVY.—Selections from the XXI and XXII books. Latin composition based on the text. The main object of this course is to secure facility in composition and translation. *I.; daily; 1; (5).* Professor BARTON.

3. TERENCE.—Phormio and selections from other plays. Scenic antiquities. Outlines of Roman literature. *II.; daily; 1; (5).* Professor BARTON.

Required: Latin 2.

4. HORACE AND CATULLUS.—The odes of Horace and the lyrics of Catullus. Their art as a contribution to the world's best literature. *I.; daily; 6; (5).* Professor BARTON.

Required: Latin 2, 3.

5. HORACE AND TACITUS.—The Satires and Epistles of Horace. Especial reference to the private life of the Romans in the time of Augusutus. The Germania of Tacitus in connection with Cæsar's account of the customs of the Germans. *I.; daily; 6; (5).* Professor BARTON. This course will be given in alternate years with course 4. [Not given in 1899-1900.]

Required: Latin 2, 3.

6. TACITUS AND PLAUTUS.—The Agricola of Tacitus considered both from the standpoint of biography and as an introduction to the style of the author. Plautus, two plays. Comedy as an exponent of social life. Themes. *II.; daily; 6; (5).* Professor BARTON.

Required: Latin 2, 3.

7. THE ROMAN HISTORIANS.—Readings from Cæsar, Livy, Sallust, Tacitus, and Suetonius. The course is partly grammatical and partly devoted to a study of the differences of style and method of treating historical themes. *I.; daily; 6; (5).* Professor BARTON. [Not given in 1899-1900.]

Required: Latin 2, 3.

8. ROMAN SATIRE AND EPIGRAM.—Selections from Juvenal, Persius, and Martial. Society in the first century. Themes. *I.; daily; 3; (5).* Professor BARTON.

Required: Latin 2, 3.

9. TEACHERS' COURSE.—A study of the aims and essentials of preparatory Latin teachings, methods of presentation, and conditions which surround the study of Latin in the high schools of the state. Students will, for a portion of the time, do the work of a preparatory class, and at intervals take charge of the recitation. *II.; daily; 3; (5).* Professor BARTON.

LAW

1. CONTRACTS.—Text-books, *Anson on Contracts,* Huffcut's Edition, and *Huffcut and Woodruff's American Cases on Contracts.* Reference books, Anson, Harriman, Pollock, Parsons. *I.; Tu., W. Th., F.; 4; (4), and II., Tu., Th.; 4; (2).* Professor PICKETT.

2. TORTS.—Text-book, *Ames and Smith's Cases on Torts.* Reference books, Bigelow, Cooley, Pollock. *I.; M., Tu., Th., F.; 2; (4), and II., Tu., Th.; 2; (2).* Professor DREW.

3. REAL PROPERTY.—Text-books, *Tiedeman's Law of Real Property and Finch's Cases on Real Property.* Reference books, Williams (Hutchins's Edition), Washburn, Digby. *I. and II.; M., W., F.; 3; (3 each semester).* Assistant Professor HUGHES.

4. DOMESTIC RELATIONS.—Text-book, *Woodruff's Cases on the Domestic Relations.* Reference books, Schouler, Browne, Bishop (Marriage and Divorce). *II.; W., F.; 4; (2).*

5. CRIMINAL LAW.—Text-books, *Washburn's Criminal Law* and *Chaplin's Cases on Criminal Law.* Reference books, Bishop, Wharton, McClain. *II.; M., Th.; 1; (2).*

6. EVIDENCE.—Text-books, *Reynolds's Theory of Evidence* and *Thayer's Cases on Evidence.* Reference books, Greenleaf, Best, Stephens's Digest. *I.; W., F.; 4; (2), and II.; Tu., Th., F.; 2; (3).* Assistant Professor HUGHES.

7. SALES.—Text-book, *Burdick's Cases on the Law of Sales.* Reference books, Benjamin, Tiedeman. *I.; M., W., F.; 2; (3).* Professor PICKETT.

8. REAL PROPERTY.—Text-books and reference books as in Law 3. *I.; Tu., Th.; 4; (2).* Assistant Professor HUGHES.

9. COMMON LAW PLEADINGS.—Text-book, *Perry's Common Law Pleadings.* Reference books, Chitty, Gould. *I.; M., W.; 3; (2).* Professor DREW.

10. AGENCY.—Text-book, *Wambaugh's Cases on the Law of Agency.* Reference books, Mecham, Huffcut, Story. *II.; M., W., Th., F.; 4; (4).* Professor DREW.

11. DAMAGES.—Text-book, *Beale's Cases on Damages.* Refer-

ence book, Sedgwick's Elements. *I.; Tu., Th.; 3; (2).* Professor DREW.

12. BAILMENTS AND CARRIERS.—Text-book, *McClain's Cases on Carriers.* Reference books, Browne, Lawson, Hale, Schouler. *II.; M., F., W.; 3: (3).* Professor PICKETT.

13. GUARANTY AND SURETYSHIP.—Text-book, *Ames's Cases on Suretyship.* Reference book, Brandt. *II.; Tu.; 3; (1).* Professor PICKETT.

14. EQUITY.—*Ames's Cases on Trusts, and Bishpam's Principles of Equity.* Reference books, Story, Mitford, Spence. *I.; M., Tu., Th.; 3; (3).* Professor PICKETT.

15. CORPORATIONS.—Text-book, *Smith's Cases on Corporations.* Reference books, Cook, Morawetz. *I.; F.; 3; (1).* Professor DREW.

16. COMMERCIAL PAPER.—Text-book, *Huffcut's Negotiable Instruments.* Reference books, Daniel, Benjamin, Chalmers's Digest, Bigelow, Tiedeman, Norton. *I.; M., Tu., Th.; 2; (3).* Assistant Professor HUGHES.

17. WILLS.—Text-book, *Chaplin's Cases on Wills.* Reference books, Bigelow, Woerner, Jarman. *I.; M., W.; 4; (2).*

18. PARTNERSHIP.—Text-book, *Mecham's Law and Selected Cases on Partnership.* Reference books, Bates, Lindley, Parsons. *II.; Tu., Th.; 4; (2).* Assistant Professor HUGHES.

19. CONSTITUTIONAL LAW.—Text-book, *Boyd's Cases on Constitutional Law.* Reference books, Story, Cooley. *II.; Tu., Th., F.; 1; (3).* (Same as Public Law and Administration 6.) Assistant Professor TOOKE.

20. EQUITY PLEADINGS.—Text-book, *Mitford's Equity and Equity Pleadings.* Reference book, Story. *II.; M.; 4; (1).*

21. INTERNATIONAL LAW.—Text-book, *Snow's Cases on International Law.* Reference books, Wharton, Phillimore, Wheaton, Walker. *I.; W., F.; 1; (2).* (Same as Public Law and Administration 9.) Assistant Professor TOOKE.

COURSES FOR GRADUATES

Major Subjects

101. Law of Real Property.
102. Construction of Contracts.
103. Wills and Administration.
104. Commercial Law.
105. Law of Corporations, Private and Municipal.

Collateral Minor Subjects

101a. Law of Personal Property.
102a. Statutory Construction.
103a. Theory and Practice of Conveyancing.
104a. Guaranty and Suretyship.
105a. Railroad or Insurance Law.

General Minor Subjects

106. Public Law and Administration.
107. Statutory Law of Illinois.

LIBRARY SCIENCE

1. ELEMENTARY LIBRARY ECONOMY.—Instruction begins with the selection of books and the placing of an order, and follows the regular librarv routine.

The work of the order department is taught by lectures and practice. American, English, French, and German trade bibliography is introduced. Instruction in the accession department is according to Dewey's Library School Rules. Lectures are given upon duplicates, exchanges, gifts, importing copyright, and allied topics.

The Dewey decimal classification is taught by classifying books. In the shelf department Dewey's Library School Rules is used and supplemented with lectures. Sample shelf-lists are made with both sheets and cards.

Cataloguing is taught according to Dewey's Library School Rules and Cutter's Rules for a Dictionary Catalogue. After each lecture students are required to catalogue independently a number of books. The class is taught to modify the rules to suit different types of libraries. Lectures are given on forms of card catalogues and mechanical accessories. Library handwriting is practiced in connection with all the work.

Instruction is given on loan systems and on binding and repair work. A comparative study of Chicago libraries is made in the second semester, when the students have become familiar with library methods.

Single lectures are given on library associations, library schools, library commissions, traveling libraries, home libraries, library economy publications, government and service, library legislation, regulations for readers, library architecture, libraries and schools, and other general subjects, to acquaint students with current general library topics. *I.; daily; 2; (10); and II.; daily; 2; (4).* Professor SHARP and Miss MANN.

2. ELEMENTARY REFERENCE.—Lectures are given on reference books considered in groups, such as indexes, dictionaries, encyclopædias, atlases, hand-books of history, hand-books of general information, quotations, statistics, etc. Reference lists are prepared for special classes and for literary societies, and the students have practical work in the reference department of the library. *I. and II.; Tu.; 1; (2 each semester).* Miss STRAIGHT.

3. SELECTION OF BOOKS.—Study is based upon the Publisher's Weekly. Each student checks desired books each week, examines them, if possible, and studies reviews in order to make a final choice of five or ten books each month. These books are carefully reviewed in class with regard to author, subject, edition, and series. Especially interesting publications, and current library topics, are called to the attention of the students at this time. This course continues through two years. *I. and II.; F.; 1; (1 each semester).* Miss STRAIGHT.

4. ELEMENTARY APPRENTICE WORK.—A laboratory for the mechanical preparation of books for the shelves is fitted up in the stack-room, and here each student is given practical work each week. Each student acts as assistant to each member of the library staff in turn, thus learning many points which cannot be given in the class-room. *I.; daily; 3; (2); and II.; daily; 2; (8).* Miss MANN.

Required: Library 1, 2.

5. ADVANCED LIBRARY ECONOMY.—In a comparative study of classification are discussed the systems of Dewey, Cutter, Edwards, Fletcher, Perkins, Smith, and Schwartz. A comparative study of cataloguing considers the rules of British Museum, Jewett, Library Association of the United Kingdom, Bodleian Library, American Library Association, Wheatly, Perkins, Cutter, and Dewey. Students revise junior cataloguing as a review, and catalogue new books for the library. Problems are given in buying supplies, in organizing and reorganizing libraries, in preparing printed finding-lists, in forming rules and regulations, and in devising loan systems. The class discusses questions affecting the founding and government of libraries, library legislation, library architecture, library administration, and current problems in public and college library work. *I. and II.; M., W.; 3; (3 each semester).* Professor SHARP and Miss MANN.

Required: Library 4.

6. Bibliography.—Lectures on subject bibliography are given by professors at the University. Students are given many practical problems. *I. and II.; Tu.; 3; (1 each semester).* Professor Sharp.

7. History of Libraries.—Libraries are studied by types and by countries. Special attention is given to libraries in the United States, their reports being used as text-books. *I.; W.; 1; (2).* Miss Straight.

8. Advanced Reference.—The course takes up public documents, transactions of societies, advanced reference books, and indexing. *I.; Th.; 1; (2); and II., first half; Th.; 1; (2).* Miss Straight.

Required: Library 1, 2.

9. Book-Making.—Lectures on the history of printing, printers' marks, book-plates, and the history and art of binding. *II., second half; W.; 1; (2).* Miss Straight.

10. Advanced Apprentice Work.—Students are allowed a certain time each day for practical library work of an advanced grade, and gain experience in every department of the library. They have charge of the Urbana public library every afternoon. *I. and II.; daily; 6; (5 each semester).* Miss Mann.

Required: Library 4.

11. Thesis.—Each student is required to present a thesis for graduation. This must be on some library topic, and must represent original research. An original bibliography, instead of a thesis, may be presented upon the approval of the director. *I.; arrange time; (1); and II.; arrange time; (3).* Professor Sharp.

Required: Library 1-10.

12. General Reference.—This course is offered to all students of the University who wish to become familiar with the ordinary reference books. It will comprise twelve lectures on the catalogue, classification, the reference-room, the reading-room, and groups of books, such as indexes, dictionaries, encyclopædias, atlases, handbooks of general information, handbooks of history, statistics, quotations, etc. *I.; arrange time; (1).* Professor Sharp.

MATHEMATICS

1. Advanced Algebra.—For students in courses requiring spherical trigonometry. This course presupposes a thorough knowledge of elementary algebra through simultaneous quadratics and proportion. Students, who for any reason have not had this elementary work recently, would find it to their advantage to review it thoroughly before commencing this course. The work will cover

the following topics: Progressions, indeterminate equations, binomial theorems for fractional and negative exponents, undetermined coefficients, decompositions of fractions, theory of limits, convergency and divergency of series, reversion of series, summation of series, logarithms, continued fractions, permutations and combinations, probability, and the loci of equations. *I.; Tu., Th.; section A, 2; section B, 4; (2).* Mr. COAR.

2. ADVANCED ALGEBRA.—For students in courses not requiring spherical trigonometry, to be taken with course 4. This course will cover all the work given in course 1, and in addition will include a short introduction to the general theory of equations, with applications to the solution of numerical equations. *I.; M., W., F.; section A, 1; section B, 2; section C, 3; section D, 4; section E, 6; (3).* Mr. BRENKE, Mr. MILNE, and Mr. COAR.

3. PLANE AND SPHERICAL TRIGONOMETRY.—This course covers the same ground in plane trigonometry as course 4. In addition to the work outlined there, about two-fifths of the term will be given to developing the general principles and applications of spherical trigonometry. *I.; M., W., F.; section A, 2; section B, 4; (3).* Mr. COAR.

Required: Solid and Spherical Geometry.

4. PLANE TRIGONOMETRY.—The following topics will be taken up, viz.: Measurement of angles, trigonometric functions and their fundamental relations, functions of the sum and the difference of two angles, functions of twice an angle and of half an angle, the construction and use of logarithmic tables, solution of trigonometric equations, the relations between the sides of a triangle and the functions of its angles, the solution of triangles, Demoiyre's theorem and trigonometric series. It is intended that this course shall be taken with course 2 in advanced algebra. *I.; Tu., Th.; section A, 1; section B, 2; section C, 3; section D, 4; section E, 6; (2).* Mr. BRENKE, Mr. MILNE, and Mr. COAR.

6. ANALYTICAL GEOMETRY.—The aim is to acquaint the student with analytical methods of investigation and to familiarize him with some of the most recent developments in synthetic geometry; to make him more skillful in the use of algebraic processes, especially as a means of demonstrating geometric properties of loci. Subjects considered are the elementary theory of the point and right line in a plane; use of abbreviated notation; elementary theory of the conic sections, their equations and properties developed analytically; poles and polars; synthetic geometry of the circle, and the discussion of the general equation of the second degree, and of some higher plane

curves. The course will also include a discussion of the following subjects: Coördinate systems for a point in space, the locus in space of an equation of the first and second degree, planes and straight lines, quadratic surfaces. *Tanner and Allen's Analytic Geometry. II.; daily; section A, 1; section B, 3; section C, 6; (5).* Mr. BRENKE, Mr MILNE and Mr. COAR.

Required: Mathematics 2, 4 or 1, 3.

7. DIFFERENTIAL CALCULUS.—Variables and functions; limits and infinitesimals; differentials and derivatives; differentiation of explicit functions, implicit functions, and functions of several variables; derivatives of higher orders; successive derivatives, developments in series; maxima and minima of functions; indeterminate forms; plane curves, tangents, and normals; asymptotes, singular points, and curve tracing; theory of envelopes, of curvature, of evolutes, and of involutes. *Byerly's Differential Calculus. I.; daily; section A, 1; section B, 2; (5).* Professor SHATTUCK.

Required: Mathematics 6.

9. INTEGRAL CALCULUS.—Elementary forms of integrations; integrals immediately reducible to the elementary forms; integration by rational transformations; integration of irrational algebraic differentials; integration of transcendent functions; definite integrals; successive integration; differentiation under the sign of integration; integration by means of differentiating known integrals; double integrals; triple and multiple integrals; product of two definite integrals.

Rectification and quadrature; the parabola, the ellipse, the cycloid, the Archimedean spiral, the logarithmic spiral, the limniscate, the cycloid, quadrature of surfaces of revolution and of surfaces in general; cubature of volumes; the sphere, the pyramid, the ellipsoid, any solid of revolution, and of volumes in general. *Byerly's Integral Calculus. II.; daily; section A, 1; section B, 2; (5).* Professor SHATTUCK.

Required: Mathematics 7.

10. THEORY OF EQUATIONS.—The development of the general properties of equations; relations of the roots and the coefficients of an equation, with applications to symmetric functions; transformation of equations; solution of reciprocal and binomial equations; algebraic solution of cubics and biquadratics; properties of derived functions; the limits and separation of the roots of equations; the solution of numerical equations of the nth degree. *Burnside and Panton's Theory of Equations. I.; M., W., F.; 1; (3).* Mr. COAR.

Required: Mathematics 2, 4 or 1, 3.

11. THEORY OF DETERMINANTS.—The origin and notation of determinants, properties of determinants, determinant minors, multiplication of determinants, determinants of compound systems, determinants of special forms—Jacobians, Hessians, Wronskians—with applications to algebra, including linear transformations, and to analytic geometry. *Hanus's Theory of Determinants,* supplemented by lectures. *I.; Tu., Th.; 1; (2).* Mr. COAR.

Required: Mathematics 7, 10.

12. THEORY OF INVARIANTS.—The course will cover the general development of the theory of invariants, both from the geometric and from the algebraic side. Applications of invariants will be made to systems of conics and to higher plane curves. Lectures with collateral reading. Mr. COAR.

Required: Mathematics 11. [Not given in 1899-1900.].

13. THEORY OF FUNCTIONS.—By way of introduction, considerable attention will be given to the geometric representation of the complex variable, including Argand's diagram, conformal representation, and harmonic ratios, and bilinear transformation. This will be followed by the development of the theory of infinite series, algebraic and transcendental functions, integration of uniform functions, Riemann's surfaces, introduction to elliptic functions, etc. *Durege's Theory of Functions and Collateral Reading. I. and II.; M., W., F.; 3; (3).* Mr. COAR.

Required: Mathematics 7, 9, 10.

14. METHOD OF LEAST SQUARES.—The object of this course is to present the fundamental principles of the subject, in a manner, so plain as to render them intelligible and useful to students of astronomy and engineering. The following subjects will be studied: Law of probability and error, adjustment of observations, precision of observations, independent and conditioned observations, etc. *Merriman's Least Squares. I.; M., W., F.; 4; (1½).* Mr. BRENKE.

Required: Mathematics 9.

15. SEMINARY AND THESIS.—*I. and II.; Tu., Th.; 3; (2).* Associate Professor TOWNSEND.

16. DIFFERENTIAL EQUATIONS.—This subject is designed for students in the courses of engineering and of mathematics and astronomy. It will embrace the following topics: General linear equations with constant coefficients, special forms of differential equations of higher order, integration of series, etc. *Johnson's Differential Equations. II.; M., W., F.; 4; (3).* Mr. BRENKE.

Required: Mathematics 9.

17. ANALYTICAL GEOMETRY OF SPACE.—A general review will be given of the position of the plane and the right line in space and the more general properties of surfaces of the second degree. To this will be added the classification and special properties of quadrics, and a brief introduction to the theory of surfaces in general. *Chas. Smith's Solid Geometry. II.; M., W., F.; 1; (3).* Mr. COAR.

Required: Mathematics 9.

18. HIGHER PLANE CURVES.—This course is designed to cover the general theory of algebraic curves, together with the application of the theory of invariants to higher plane curves. Special study will be made of curves of the third and fourth order. *Lectures with collateral reading.*

Required: Mathematics 12. [Not given in 1899-1900.]

20. CALCULUS OF VARIATIONS.—This course has for its aim merely to acquaint the student with those elements of the science which are most needed in the study of the higher subjects of mathematical astronomy and physics. *Carll's Calculus of Variations. I.; M., W., F.; 4; (1½).* Professor MYERS.

Required: Mathematics 11, 16.

21. SPHERICAL HARMONICS.—In this course, a thorough study is made of so much of this subject as is of interest to an astronomer. It is introduced by a short course of lectures and study of certain trigonometric series. Fourier's Theorem for developing any function of a variable in a series proceeding in sines and cosines of multiples of the variable is derived and the limitations of its validity investigated. This is followed by the study of Lagrange's, Laplace's and Lamé's functions and their applications to astronomical and physical problems. *Byerly's Fourier's Series and Spherical Harmonics. I.; M., W., F.; 7; (3).* Professor MYERS.

Required: Mathematics 11, 14, 16.

22. POTENTIAL FUNCTION.—The potential function is defined and its properties derived and discussed. The potential of various bodies; such as of a wire, a spherical shell, a sphere, elipsoid of revolution, etc., is computed. Poisson's and Laplace's Equations are derived and discussed. Green's Propositions with kindred and similar subjects are handled. *Pierce's Newtonian Potential Function. II.; M., W., F.; 7; (3).* Professor MYERS.

Required: Mathematics 21; Astronomy 6.

23. MODERN GEOMETRY.—This course will include in general a consideration of homogeneous coördinates, duality, descriptive and metrical properties of curves, anharmonic ratios, homography, involu-

tion, projection theory of correspondence, etc. *Scott's Modern Analytic Geometry.* Associate Professor TOWNSEND.

Required: Mathematics 8, 11. [Not given in 1899-1900.]

24. ALGEBRAIC SURFACES.—In this course will be considered the application of homogeneous coördinates and the theory of invariants to geometry of three dimensions, and also the general theory of surfaces, together with the special properties of surfaces of the third and fourth order. *Lectures with collateral reading.* Associate Professor TOWNSEND.

Required: Mathematics 17, 18. [Not given in 1899-1900.]

MECHANICAL ENGINEERING

1. SHOP PRACTICE.—In the shops the work, as far as possible, is carried along the same lines as are practiced in our leading commercial shops. The exercises are, in general, chosen from parts of machines under construction, and carefully graded to the skill of the student. Beginning with the care and use of the tools with which he is to work, the student is carried through the various operations of machine-shop practice. Following is an outline of the work, that of the two semesters being subject to transposition.

First Semester, Wood Shop.—Primary exercises relating to the care and use of tools and the construction of a series of exercises in joint work and turning preparatory to pattern making.

Pattern and core box making with special reference to molding.

Second Semester, Foundry and Forge Shop.—One-half of this semester is devoted to instruction in the management of the cupola and molding, including the making of green and dry sand cores. One-half of the semester is devoted to instruction in forging and welding iron and steel. Special attention is given to tempering of lathe and planer tools, also to case-hardening and annealing. *I. and II; daily; section A, 1 and 2; section B, 3 and 4; section C, 6 and 7; (3½).* Mr. CURTISS, Mr. WILSON, and Mr. JONES.

2. SHOP PRACTICE.—First Semester. Instruction in chipping, filing, and elementary machine work. Lectures.

Second Semester.—Instruction in the various operations of lathe, planer, drill press, shaper, grinding machine, milling machine, boring mill, as well as fitting and bench work. Lectures. *I. and II.; daily; 6, 7, and 8 (divides time with M. E. 4); (2½).* Assistant Professor VANDERVOORT and Mr. CLARK.

3. POWER MEASUREMENTS.—This is the beginning of the work in the mechanical engineering laboratory, and is intended for students

taking the mechanical engineering course. A study is made of the use and construction of the steam engine indicator. The measurement of power developed by the steam engine under different conditions is made a prominent part of the work. The method of applying friction brakes and measuring transmitted power is also taken up. *I. and II.; Tu., Th., 6, 7, and 8; S., 1, 2, 3; (2).* Mr. OLIVER.

Required: Mechanical Engineering 1, 2; Math. 9.

4. ELEMENTS OF MACHINE DESIGN.—The basis of this work is found in *Klein's Elements of Machine Design.* A series of plates 26x40 inches is constructed, covering a wide range of machine parts. There are 334 formulas, empirical and rational, the use and derivation of which are explained. By means of a large number of practical examples, sufficient drill is obtained in using them to enable the student to make the calculations required when designing various parts of machines. Theoretical and practical problems relating to gearing are taken up and worked out in detail. Instruction in blue printing and duplicating is included in the course. For description see Chem. 22c, p. 188. *Kent's Mechanical Engineer's Pocket-book; Low and Bevis' Machine Design; also Unwin's Machine Design. I. and II.; daily; 6, 7, and 8 (divides time with M.E. 2); (2½).* Mr. SCHMIDT.

Required: General Engineering Drawing 1, 2.

5. MECHANISM.—A study of nature and equivalence of mechanisms. Determination of centrodes. Graphical diagrams of the paths, speeds, and accelerations of important points of familiar mechanisms. Laying out of cams. Analysis of difficult mechanisms. Determination of velocity ratios. Particular attention is paid to problems relating to motions of gearing, steam-engine mechanisms, parallel motions of indicators, governors, link motions, valve gears, and indicator riggings. *I.; M., W., F.; 3 and 4; (3).* Mr. SCHMIDT.

6. HEAT ENGINES.—The application of the theory of thermodynamics to gas and gasoline engines and hot air engines. A study of the modern forms of heat engines. Lectures and assigned readings. *I.; Tu., Th.; 1; (2).* Professor BRECKENRIDGE.

Required: Theoretical and Applied Mechanics 1; Mathematics 9; Physics 1, 3; Mechanical Engineering 7.

7. THERMODYNAMICS.—The fundamental principles underlying the transformation of heat into work, more especially as exemplified in the steam engine, are carefully studied. Considerable attention is paid to the solution of numerous examples, such as will arise in steam, air, or gas engineering. Drill is given in the rapid and

accurate use of standard steam tables. *I.; M., W., F.; 1; (3).* Professor BRECKENRIDGE.

Required: Math. 9; Theoretical and Applied Mechanics 1; Physics 1, 3.

8. MECHANICS OF MACHINERY.—This is a study of the theoretical principles involved in the construction of such machinery as comes under the head of hoisting apparatus, pumping engines, air compressors, fans, blowers, machinery for transmitting power, locomotives, pile drivers. *II.; Tu., W., Th.; 1; (3).* Professor BRECKENRIDGE.

Required: Theoretical and Applied Mechanics 1, 2, 3; Mechanical Engineering 5, 7, 14, 15.

9. ADVANCED DESIGNING.—This work follows the design of a high-speed steam engine, and comes under two heads.

Advanced Design: Under this head the work begins with simple machines and extends to more difficult designs as the student progresses. The design of attachments to existing machines, or the complete design of some machine that can be built in the shops, is often a part of this work. Such designs as hoists, pumps, drills, lathes, etc., are undertaken.

Original Design: In this work the student's previous training in designing is combined with his inventive ability, and often valuable and ingenious work is done. The machines are to be designed for accomplishing a certain prescribed work. Often but a single piece is handed the student, and a machine is required which will produce a given number of these pieces per hour.

A large amount of study of existing machines is required. The student is taught to consult the standard works on designing, such as *Unwin, Reuleaux, Klein, Marks, Richards,* and to use such books as *Kent, Nystrom, Haswell, Taschenbuch der Hutte,* etc. *I.; Tu., Th.; 6, 7, 8; (2); II.; Tu., W., Th.; 6, 7, 8; (3).* Assistant Professor VANDERVOORT and Professor BRECKENRIDGE.

Required: Theoretical and Applied Mechanics 1, 2, 3; Mechanical Engineering 1 to 8, and 14.

10. ESTIMATES, SPECIFICATIONS, AND SUPERINTENDENCE.—Calculations and estimates are made as to the cost of machinery, power plants, boilers, chimneys, systems of piping, engines and their foundations, different methods of power transmission.

Also forms of contracts and specifications are studied. *II.; Tu., Th.; 2, 3, 4; (2).* Professor VANDERVOORT.

Required: Theoretical and Applied Mechanics 1, 2, 3; Mechanical Engineering 1 to 6, 9, 12.

12. ADVANCED MECHANICAL ENGINEERING LABORATORY.—This work is a continuation of the work begun in the junior year. Experiments are made with engines, pumps, motors, injectors, and boilers to determine under what conditions they may be expected to give a maximum effiiciency. Tests of plants in the vicinity are made, of which carefully prepared reports are always required. Through the kindness of Mr. W. Renshaw, Superintendent of Machinery of the Illinois Central Railroad, opportunities will be afforded to do practical work in locomotive testing, and considerable apparatus has been constructed for this important work. A dynamometer car is now owned and operated by the department and the P. & E. Div. of the "Big Four" Ry., which furnishes unexcelled opportunities for experimental railway engineering. Advanced constructive work in the shops is assigned to groups of students, in order to impress upon them the intimate relation existing between the designing room and the shop. *Carpenter's Experimental Engineering. I.; M., F.; arrange time; ; (4); II.; M., F.; 1; (2).* Professor BRECKENRIDGE, Assistant Professor VANDERVOORT, and Mr. OLIVER.

Required: Theoretical and Applied Mechanics 1, 2, 3; Mechanical Engineering 1 to 7, 14, 15.

13. MECHANICAL ENGINEERING LABORATORY.—This is a laboratory course in which the student is taught to apply the indicator to different engines and to make the usual calculations of horse power and steam consumption as given by the diagrams. Correct forms of reducing motions are explained. How to read indicator diagrams and valve setting is also taught. *Indicator Practice and Steam Engine Economy—F. F. Hemenway. II.; Th., F.; 6, 7, 8; (2).* Mr. OLIVER.

Required: Mechanical Engineering 1, 2; Math. 7, 8, 9.

14. HIGH SPEED STEAM ENGINE AND VALVE GEARS.—Under this head the steam engine is carefully studied. Each part of a complete engine is designed, and detailed drawings made and traced, so that each member of the class may have a complete set of blue prints.

The application of graphical diagrams as an aid in the study and design of valves for steam distribution in the engine cylinder is carefully brought out. Determination of the dimensions of steam passages, single valve gears, double valve gears, equalization of steam distribution, application of diagrams to existing types of engines. *Klein's High Speed Steam Engine. I.; Tu., W., Th.; 2, 3, 4; (3).* Assistant Professor VANDERVOORT.

Required: Mechanical Engineering 1 to 7, 16, 17; Theoretical and Applied Mechanics 1, 2.

16. STEAM ENGINES.—A study of the details of steam engines. Elementary principles of transformation of heat into work. Laws of expansion of steam. The mechanics of the steam engine. Valves and valve gears. The indicator diagram, condensers, steam jackets, super-heaters, and compound engines. *The Steam Engine, Holmes. I.; Tu., Th.; section A, 1; section B, 2; (2).* Assistant Professor VANDERVOORT.

Required: Theoretical and Applied Mechanics 1; Physics 1, 3.

17. STEAM BOILERS.—Materials used in the construction of boilers. Proportions and strength of riveted joints. Methods of setting boilers for maximum efficiency. Incrustation, explosions, combustion, safety appliances, feed apparatus, boiler trials. *Peabody and Miller's Steam Boilers. II.; M.; section A, 1; section B, 2; (1).* Mr. SCHMIDT.

Required: Mechanical Engineering 1; Physics 1, 3; Mathematics 2, 4, 6.

18. GRAPHICAL STATICS OF MECHANISM.—Graphical determination of the forces acting at different points in machines used for hoisting, crushing, punching, and transmitting motion, taking into account the resistances offered to motion by frictional resistances. Effort of sliding, rolling, and journal friction, chain friction, tooth friction, stiffness of ropes and belts. Graphical determination of the efficiency for the forward and reverse motion. *Graphical Statics of Mechanism, Herrmann-Smith. II.; W.; 2, 3, 4; (1).* Mr. SCHMIDT.

Required: Theoretical and Applied Mechanics 1, 2.

19. SEMINARY.—Work supplementary to other studies of the senior year. Presentation of papers on assigned subjects. Contributed papers on current topics. Discussion and criticisms on new inventions. *I.; W.; 6 and 7; II.; M.; 6 and 7; (1).* Professor BRECKENRIDGE.

20. SHOP PRACTICE FOR SPECIAL STUDENTS.—This course is open to those entering as special students, as defined elsewhere under "Admission." The work will be arranged after consultation. The work done does not count for a credit for graduation in any of the technical courses. *Arrange time.* Assistant Professor VANDERVOORT.

21. FORGE SHOP PRACTICE.—This course is designed for students taking the winter course in Agriculture. The work covers instruction in forging, such as will be of use to the practical farmer. *Arrange time.* Mr. JONES.

COURSES FOR GRADUATES

Primary

101. Advanced Machine Design.
102. Graphics and Kinematics.
103. Mill Engineering.
104. Steam Engineering.
105. Experimental Engineering.
106. Thermodynamics.
107. Pneumatics.
108. Hydraulic Machinery.
109. Mechanical Technology.
110. Translation of Technical Engineering Work.
111. Heat Engines and Gas Engineering.
112. Locomotive Engineering.
113. Mechanical Refrigeration.

Secondary

120. Any primary offered in the College of Engineering. Primary subjects may be taken as secondary in any course for the master's degree in the College of Engineering.

121. Indexing and Classification of Engineering Literature.

MECHANICS, THEORETICAL AND APPLIED

1. ANALYTICAL MECHANICS.—The mechanics of engineering, rather than that of astronomy and physics, is here considered. In addition to fixing the fundamental concepts and demonstrating the general principles of equilibrium and motion, application of principles and methods is made to numerous and varied engineering problems in such a way that the student must discriminate in the use of data and in the statement of conditions. As mathematical processes and forms express most readily and quickly the rules and methods for the solution of such problems, such training is given with special care. This subject requires a thorough working knowledge of the mathematics preceding it in the course. The methods of the calculus are used whenever preferable.

Outline of the subject: Nature and measure of force; composition and resolution of forces; moments; conditions of equilibrium; resultant of systems of forces; center of gravity; moment of inertia; rectilinear and curvilinear motion, and the relation between such motion and the constraining and accelerating forces; dynamics of a rigid body; momentum and impact; work, energy, and power;

mechanical advantage. *Bowser's Analytical Mechanics. I., first 14 weeks; daily; section A, 1; section B, 2; (5).* Professor TALBOT.

Required: Mathematics 9.

2a, b. RESISTANCE OF MATERIALS.—In the treatment of this subject it is the aim to give the student a thorough training in the elementary principles of the mechanics of materials, to follow with such experiments and investigations in the materials laboratory as tend to verify the experimental laws, and to add such problems in ordinary engineering practice as will train the student in the use of his knowledge. Attention is also given to the quality and requirements for structural materials.

Outline of the subject: Elasticity of materials; stresses and strains; experimental laws; working strength for different materials; resistance of pipes and riveted joints; bending and resisting moment, shear, and elastic curve of cantilever, simple, restrained, and continuous beams; column formulas; torsion and shafts; maximum internal stresses in beams; fatigue of metals; working strength for repeated stresses; resilience; reliability of the common theory of flexure, as shown by actual experiment; design and strength of rolled and built beams and columns; specifications for materials and methods of testing. *Merriman's Mechanics of Materials. I., last four weeks; daily; section A, 1; section B, 2. II., first 7 weeks; Tu., W., Th., F.; section A, 1; section B, 2; arrange for one laboratory period of two hours each week; (5).* Professor TALBOT.

Required: Math. 9; Theoretical and Applied Mechanics 1.

3. HYDRAULICS.—In hydraulics the instruction is by text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the hydraulic laboratory gives training in the observation and measurement of pressure, velocity, and flow, and in the determination of experimental coefficients.

The subject covers the following: Weight and pressure of water; head; center of pressure; velocity and discharge through orifices, weirs, tubes, nozzles, pipes, conduits, canals, and rivers; measurement of pressure velocity, and discharge; meters and measurements; motors, turbines, and water wheels; water power and transmission of power. *Merriman's Hydraulics. II., last 11 weeks; Tu., W., Th., F.; section A, 1; section B, 2; arrange for one laboratory period of three hours each week; (5).* Professor TALBOT.

Required: Mathematics 9; Theoretical and Applied Mechanics 2.

4. APPLIED MECHANICS.—To be taken instead of Analytical

Mechanics. The course of study and topics studied will be nearly identical. *Wright's Mechanics. I.; M., Tu., W., F.; 2; (3).* Assistant Professor McLane.

Required: Mathematics 6.

5. Strength of Materials.—To be taken instead of Resistance of Materials. The course of study will be nearly the same, though somewhat simplified. *Merriman's Mechanics of Materials. II.; Tu., F., 1; M., W., 6; arrange for ten laboratory periods of two hours each; (4).* Assistant Professor McLane.

Required: Mathematics 6; Theoretical and Applied Mechanics 4.

COURSES FOR GRADUATES

101. Analytical Mechanics.
102. Resistance of Materials.
103. Hydraulics and Hydraulic Engineering.
104. Laboratory of Applied Mechanics.

MILITARY SCIENCE

1. Drill Regulations.—For all male students. First term: school of soldier; bayonet exercise; second term: school of company, close and extended order. *I.; (1).* Professor ——

2. Practical Instruction in School of Soldier.—Company and battalion in close and extended order; school of the cannoneer and of the battery dismounted; target practice. Freshmen and sophomore years. *I. and II.; (1 each semester).* Professor ——

3. Recitations and Practice for Officers and Non-Commissioned Officers.—*Sophomore year:* School of the battalion close and extended order; ceremonies; review and inspection; military signaling; guard, outpost, and picket duty. *Junior year:* military administration; reports and returns; theory of firearms and target practice; organization of armies; field fortifications; art of war. This course is obligatory upon officers and non-commissioned officers, and open to others. Five semesters, recitations one to two hours a week; drill two hours a week. Professor ——

MINERALOGY

1. Elements of Mineralogy.—(a) The first term's work is a general introduction to the subject. Instruction includes lectures and laboratory practice. In the lectures, which occur on specified days (2 or 3 each week), such subjects as follow are discussed: Genesis of minerals; conditions favoring their deposition; origin of the massive and crystalline forms; relationships of minerals and their classi-

fication; the physical properties of minerals, as color, luster, hardness, gravity, streak, etc., with the conditions which may cause these properties to vary; elements of crystallography.

In the laboratory the student is first made acquainted with the simplest trustworthy methods for proving the presence or absence of the acids and bases. He is then required to determine a large number of species by their physical and chemical properties only.

(b) Petrography of Crystalline Rocks: The instruction under this topic is given by lectures and laboratory work. The subjects included are the classification of rocks, the methods used in their determination, the conditions governing the formation of each species, the decompositions to which they are liable, and the products of these decompositions. Each student is supplied with a set of blowpipe tools and reagents, and a series of hand specimens covering all the common species of rocks. The course is continued under Geology 1b. *I.; daily; 1 and 2; (5).* Professor ROLFE and Mr. HUBBARD.

Required: Chemistry 1.

2. ADVANCED MINERALOGY.—(a) Crystallographic Mineralogy. During the second semester a careful study of the forms of crystals is made, including the measurement of angles and determination of complex forms. The student is also required to identify many species of minerals by their crystalline forms, and to verify his conclusions by the methods in use during the preceding term.

(b) Optical Mineralogy. The work of the semester will be devoted to the microscopic determination of rock forming minerals; to methods for separating the minerals constituents of fine-grained rocks, etc. *II.; daily; 3 and 4; (5).* Professor ROLFE and Mr. HUBBARD.

Required: Mineralogy 1.

MUNICIPAL AND SANITARY ENGINEERING

1. ROAD ENGINEERING.—The value and importance of road improvement in country highways and the best means of securing it are considered, together with the principles and details of construction of earth, gravel, and macadam roads. In city streets, the methods of construction, cost, durability, and desirability of the various kinds of pavement, and the questions of grades, cross-sections, methods of assessment of cost, and methods of maintenance and cleaning are treated. *Byrne's Highway Construction. Lectures and Reading. II.; Th. or F.; 3; (1).* Mr.——.

Required: Math. 4; General Engineering Drawing 1, 2; Civil Engineering 1, 2, 3, 4.

2. WATER SUPPLY ENGINEERING.—This subject is intended to cover the principal features of the construction of water works, including the tests and standards of purity of potable water; the choice of source of supply; the designing of the distribution system, pumps and pumping machinery, reservoirs, and stand-pipes. *Lectures; Fanning's Water Supply Engineering. I.; M., Tu., W., Th.; 4; arrange for drafting, 12 periods, M., 6, 7, and 8; (4).* Professor TALBOT.

Required: Theoretical and Applied Mechanics 1, 3; Chemistry 1; Mechanical Engineering 16.

3. SEWERAGE.—The design and methods of construction of sewerage systems of cities, including the following: Sanitary necessity of sewerage; water carriage systems, both separate and combined; surveys and general plans; hydraulics of sewers; relation of rainfall to storm water flow, and determination of size and capacity of sewers; house sewage and its removal; form, size, design, and construction of sewers and sewer appurtenances; modern methods of sewage disposal; estimates and specifications.. *Lectures; Folwell's Sewerage. II.; M., Tu., W.; 4; arrange for drafting, 10 periods, M., 6, 7, and 8; (3).* Professor TALBOT.

Required: Theoretical and Applied Mechanics 1, 3; Chemistry 1.

5a. BACTERIOLOGY.—For students in Municipal Engineering. This course includes the identification and classification of bacteria, and of allied organisms, their relations to health and to disease, the methods of separation and cultivation, and the methods of air and water analysis. The laboratory is furnished with sterilizers, culture ovens, microscopes, etc., and students have abundant opportunity to do practical work. This course follows civil engineering 4a. *I., last 7 weeks; daily; 6 and 7; (2).* Professor BURRILL.

6. WATER PURIFICATION, SEWAGE DISPOSAL, AND GENERAL SANITATION.—This work includes the consideration of impurities in water supplies and the study of the methods and processes of their removal; the modern methods of sewage disposal by filtration, chemical precipitation, irrigation, etc., with a study of representative purification plants; garbage collection and disposal; sanitary restrictions and regulations and general sanitation. Lectures and seminary work. *II.; W., Th., F., 3, M., Tu., 6; (5).* Professor TALBOT.

Required: Municipal and Sanitary Engineering 2, 3, 5a; Chemistry 1, 3a.

COURSES FOR GRADUATES

Water Supply Engineering

101. Tanks, Stand Pipes, and Reservoirs.
102. Sources and Requirements of Water Supply for a City and Removal of Impurities.
103. Water Works Management and Economics.
104. Pumps and Pumping.
105. General Water Works Construction.
106. Biological and Chemical Examination of Potable Water.
107. Description of Water Supply Systems.

Sewerage

111. Sewage Purification.
112. Sewage Disposal Works.
113. General Sewerage Design and Construction.
114. City Sanitation.
115. Description of Sewerage Systems.

Road Engineering

118. Economic Aspect of Good Roads and Pavements.
119. Construction of Roads and Pavements.

Miscellaneous Subjects

121. Critical Description of Engineering Construction.
122. Translation of Technical Engineering Work from French or German.
123. Any Primary in Civil Engineering.
124. Any Primary in Theoretical and Applied Mechanics.
125. Any Primary in Mathematics, Mechanical Engineering, or Electrical Engineering—Secondary.
126. Indexing of Municipal and Sanitary Engineering Literature in Engineering Periodicals.

MUSIC

Course 1 will be counted for credit toward the regular degree for students in the College of Literature and Arts, provided they are at the same time enrolled *in the department of music.* Courses 7 and 8 are counted for credit for all students who take them.

1. History of Music.—Lectures on the development of music from its beginning among the Greeks to the present day, including the rise of dramatic music, the origin and progress of the oratorio,

the evolution and development of instrumental forms, and studies in the lives of the composers. Assigned collateral readings. *I. and II.; arrange time; (3).* Miss PUTNAM.

2. THEORY OF MUSIC.—a. A course in harmony, two hours a week, in class, through three semesters. *Emery's Harmony* with additional exercises. *Weitzman's Theory of Music. (13 in all).*

b. A course in counterpoint, two hours a week in class through one semester. *Richter's Counterpoint. (3).*

c. A course in fugue, two hours a week in class through one semester. *Richter's Fugue. (3).*

d. A course in musical analysis which may be taken at the same time with the studies in counterpoint and fugue. The second, third, and fourth parts of this course are open only to advanced students showing special aptitude. *(3).* Miss PUTNAM.

3. COURSE FOR THE PIANO.—(a) *Preparatory.* This course is equivalent to three years' work. It includes formation and position of fingers, hands, wrists, and arms, properties of touch, principles of technique, thorough drill in scale and arpeggio playing, and exercises in accent, rhythm, and expression. Music used: Herz, Scales and Exercises; Loeschhorn, Op. 65, 66; Lemoine, Op. 37; Heller, Op. 45; Bertini, Op. 29, 32; Czerny, Op. 299, Bks. 1, 2; Bach's Little Preludes; also sonatinas and easier sonatas and compositions by Clementi, Kuhlau, Haydn, Mozart, Mendelssohn, Merkel, Dussek, Diabelli, Grieg, Bargiel, and others. Miss FOX.

(b) *Collegiate.* First year. Studies in development of technique: Czerny, Op. 299, Bks. 3, 4; Czerny, Octave Studies; Cramer, Études; Jensen, Études; Bach, Two-Voice Inventions and French Suites; sonatas of Haydn and Mozart; easier Sonatas of Beethoven; Songs Without Words, Mendelssohn; compositions (smaller works) of Beethoven, Chopin, Schubert, Raff, Grieg, Chaminade, Moszkowski, and others. *(10 in all).* Professor JONES and Miss FOX.

Second Year. Daily technique; Czerny, Op. 740; Bach, Three-Voice Inventions and English suites; sonatas and other compositions of Scarlatti, Beethoven, Schubert, Schumann, Mendelssohn, Weber, Raff, Rubinstein, Saint Saens, Godard, MacDowell, and others. *(13 in all).* Professor JONES and Miss FOX.

Third Year. Selections: Clementi, Gradus ad Parnassum; Moscheles, Op. 70; Kullak, Seven-Octave Studies, Bk. 2; Bach, Well-Tempered Clavichord; sonatas and concertos by Mendelssohn, Weber, Beethoven, Hummel, Brahms, etc.; selections from works of Bach, Chopin, Schubert, Schumann, Brassin, Rubinstein, Liszt, Moszkowski, Scharwenka, and other modern composers. *(17 in all).* Professor JONES.

Fourth Year. Selections: Octave Studies; Clementi, Gradus, continued; Bach, Well-Tempered Clavichord, continued; Chopin, Études; Henselt, Études; Rubinstein, Études; sonatas by Beethoven, and concertos and other compositions by the great masters, classic and romantic, both of the older and the more modern schools. *(17 in all).* Professor JONES.

4. a and b. COURSE FOR THE ORGAN.—Similar preparatory and collegiate courses for the organ will be offered for any one caring to make this the principal instrument. Professor JONES.

5. COURSE FOR THE VOICE.—(a) *Preparatory.* The placing of the voice and proper position of the mouth and throat. Randegger's Singing. The first fifteen of the Fifty Conçone Studies. Simple songs for rhythm, accent, and proper pronunciation of words.

(b) *Collegiate.* First Year: Voice production, Randegger's Singing continued. All the Fifty Conçone Studies. Songs of Mendelssohn, Schubert, and those of good modern composers. *(10 in all).*

Second Year: Voice production. Viardot-Garcia's Hour of Study. Book I for technical work. Twenty-five and Fifteen Conçone Studies for soprano and tenor and the Forty Conçone for alto and bass. Songs of German, French, and English composers, and simple selections from operas and oratorios. *(13 in all).*

Third Year: Voice production. Viardot-Garcia's Hour of Study, Book II. Bordigni's Thirty-six Studies for soprano or tenor, its equivalent, Sieber or Bordese for alto or bass. Selections from oratorios and from French, German, and Italian operas. Songs of considerable difficulty by German, English, French, and Italian composers. *(17 in all).*

Fourth Year: Voice production. The Twenty-four Panoflra Studies. Lütgen's Operavocalisen, Book II. Italian, French, German, and English songs of all standard composers. Solos and concerted work from the modern as well as the standard operas and oratorios. *(17 in all).* Miss FERNIE.

6. COURSE FOR THE VIOLIN.—(a) *Preparatory.* Violin methods by Hermann, Kayser, Sitt, Mazas, etc. Schradieck's Technical Studies. Études by DeBeriot, Murts. Easy solos.

(b) *Collegiate.* First Year: Études by Kreutzer, Mazas, Fiorillo, etc. Concertos by Viotti, Rode, Kreutzer, DeBeriot. Sonatas by Mozart, Beethoven, Handel, Gade. *(10 in all).*

Second Year. Etudes by Rode, Gavinies and Campagnoli. Concertos by Spohr, Bruch, Vieuxtemps, Molique, etc. Sonatas by Beethoven and Grieg. *(13 in all.)*

Third Year: Caprices by Paganini. Concertos by Bruch, Mendelssohn, Saint Saens, Joachim. Ensemble work. *(17 in all).*

Fourth Year: Bach sonatas. Concertos by Beethoven, Bruch, Brahms, Tschaikowsky, Dvorak, Saint Saens. Ensemble work. *(17 in all.)* Miss PUTNAM.

7. University Orchestra. *Two hours' rehearsal once a week throughout the year. (2)* Professor JONES.

8. University Oratorio Society. *One hour rehearsal once a week throughout the year. (1).* Miss FERNIE.

PALEONTOLOGY*

1. ADVANCED PALEONTOLOGY.—The work outlined under geology 1d can do little more than introduce the general subject. To those who desire a better acquaintance with paleontology a course of two terms is offered.

This course will include: (a) Discussion of the biological relations to fossil forms along the lines indicated in Williams' Geological Biology; (b) a discussion of the principles of classification as applied to fossils, together with the characteristics which distinguish the larger groups, using Nicholson and Zittel as guides; (c) a study of the distribution and variations of the genera and species of one or more of the more important groups as illustrated by the collections of the University, using the various state reports and Miller's Handbook as aids. Ten hours per week. A major in botany and zoölogy would aid the student greatly in this work, but neither is required. See under mineralogy and geology. *I. and II.; daily; 3 and 4; (5 each semester).* Professor ROLFE and Mr. HUBBARD.

Required: Geology 1.

PEDAGOGY

1. THE PSYCHOLOGY OF THE TEACHING PROCESS.—(a) The nature and organic elements of the process deduced and exemplified in various subjects. (b) The science of the recitation deduced from the foregoing, including the central principles of school organization and management. *I.; daily; 6; (5).* Professor TOMPKINS.

Required: Two years of University work.

2. THE FUNDAMENTAL AIM AND PROCESS OF EDUCATION.—As determined by the nature of spiritual life, in its two-fold tension between ideal and real, and subject and object. The ethical aspect

of education. *II.; daily; 6; (5).* Professor TOMPKINS and Assistant Professor MCGILVREY.

Required: Two years of University work.

3. THE LOGICAL PROCESS INVOLVED IN EDUCATION.—(a) The Universal law of thought. (b) The organic phases of the logical process, ascertained and reduced to the details of instruction. Universal and special method. *I.; daily; 2; (5).* Professor TOMPKINS.

Required: Pedagogy 2.

4. THE ESTHETIC ASPECT OF EDUCATION—In relation to the ethical and logical aspects developed in courses 2 and 3. (a) The esthetic interpretation of the world, the process and educational value. (b) The method and value of art and literary interpretation. *II.; daily; 6; (5).* Professor TOMPKINS and Assistant Professor McGILVREY.

Required: Pedagogy 2 and 3.

COURSES FOR GRADUATES

101. THE PHILOSOPHY OF EDUCATION.—The ultimate principle of education developed and applied to show how it controls all the details of life and school work.

102. THE HISTORY OF PHILOSOPHY AND OF EDUCATION.—An educational interpretation of the leading systems of philosophy from the Greeks to the present, with the historical development of educational ideals and educational systems.

PHILOSOPHY

1. LOGIC.—For the required credit in philosophy, students may select either of the following courses:

a. This course considers the nature of judgment and inference. Emphasis is laid upon practice in division, definition, forms of syllogism, deductive and inductive fallacies. This course is recommended to students who are interested in psychology or philosophy. *I.; M., W., F.; 2; (3).*

b. Special attention is given to fallacies and to the problems, grounds, and principles of induction. The study is designed not only to direct the student in practical reasoning and correct thinking, but also to familiarize him with the principles and methods of scientific investigation. *II.; M., W.. F.; 2; (3).* Assistant Professor DANIELS.

2. OUTLINES OF PHILOSOPHY.—A general introduction to the study of philosophy. *I.; M., W., F.; 4; (3).* Assistant Professor DANIELS.

3. ANCIENT AND MEDIÆVAL PHILOSOPHY.—A rapid survey is taken of the development of speculative thought, beginning with the early Greek philosophers and continuing through the mediæval period. *I.; Tu., Th.; 3; (2).* Assistant Professor DANIELS.

4. MODERN PHILOSOPHY.—This course considers the formation and development of the problems and conceptions in philosophy from Descartes to the present time. Selections from the philosophical masterpieces of this period are carefully studied. Special emphasis is laid upon the philosophy of Kant. *II.; daily; 3; (5).* Assistant Professor DANIELS.

5. ADVANCED PHILOSOPHY.—The seventeenth century philosophy. A critical study of Descartes, Spinoza, and Leibnitz. *I. and II.; Tu., Th.; 7; (2 each semester).* Assistant Professor DANIELS.

Required: Two semesters in philosophy or psychology.

6. PRACTICAL ETHICS.—In this course those questions which bear the closest relation to life and conduct are raised and discussed. The duties of the individual, the family, and the state are among the subjects considered. Special subjects in social ethics may be taken up. *I.; Tu., Th.; 1; (2).* Assistant Professor DANIELS.

7. HISTORY AND CRITICISM OF ETHICAL THEORIES.—A careful and historical examination of the various types of ethical theory, including rational, hedonistic, eudemonistic, esthetic, and evolutional ethics. It is designed to make the student as familiar as the time allows with the writings of representative men of the various schools. *II.; M., W., F.,; 1; (3).* Assistant Professor DANIELS.

8. ESTHETICS.—A brief history and a critical study of the various theories of the beautiful. Lectures and assigned readings. *II.; Tu., Th.; 4; (2).* Assistant Professor DANIELS. [Open to juniors and seniors.]

COURSE FOR GRADUATES

101. The Philosophy of Kant.

PHYSICAL TRAINING

For Men

1. GYMNASIUM PRACTICE.—Two half hours' class-work, and two half hours' prescription exercises, each week. Required of freshmen throughout the year. *With course 3, for 2½ hours.* Professor SHELL.

2. GYMNASIUM PRACTICE.—Two half hours' class-work and two half hours' prescription exercises each week throughout the year. *With course 4, 2½ hours.* Professor SHELL.

Required: Physical Training 1 and 3.

3. Lectures.—Lectures upon bodily health, including such subjects as the bath, sleep, diet, ventilation, clothing, injuries from over-work and study, sedentation, tobacco, alcohol, improper posture, etc. Once a week throughout the year. Freshmen are required to attend this course. *With course 1, 2½ hours.* Professor Shell.

4. Lectures.—Muscular form and action, effects of exercise, causation of fatigue, breathlessness, coördination, automatism, deformities, etc. Once a week throughout the year. *With course 2, 2½ hours.* Professor Shell.

Required: Physical Training 1 and 3.

5. Theory of Physical Training.—For those preparing as instructors. Study of the systems of gymnastics; methods of teaching; class work; use of apparatus; effects on body; measurements; testing, prescription. Throughout the year. *2 hours.* Professor Shell.

Required: Courses 2 and 4.

6. Competitive Athletics.—History of games and sports; general training; special forms and methods of coaching for track, fencing, wrestling, boxing, base ball, foot ball, basket ball, hockey, etc. Throughout the year. *2 hours.* Professor Shell.

Required: Physical Training 2 and 4.

For Women

7. Practice.—Class and prescription exercises in the gymnasium and field, three hours a week throughout the year. Required of freshmen. *With course 9, 3 semester hours.* Miss Carpenter.

8. Practice.—Three hours a week throughout the year. *2 hours.* Miss Carpenter.

Required: Physical Training 7, 9.

9. Hygiene.—The same as physiology 6, which see. Required of freshmen. *With course 7, 3 hours.* Professor Kemp.

PHYSICS

1. General Physics.—A course of experimental lectures. The subjects for the first semester are mechanics, heat and sound; for the second semester, electricity and magnetism and light. The course is always to be taken in connection with the laboratory course, Physics 3. *I. and II.; Lectures, M., W., F., 5; Quiz, Tu. or Th., 3; (2½).* Professor Carman and Mr. Carpenter.

Required: Mathematics 3 or 4.

2. Minor Course in Physics.—The course includes selected parts in mechanics, heat, light, and electricity, and is designed for

students in general science and in medical courses. *Second semester. II.; Lectures, Tu. and Th., 5; Laboratory, 7 periods, arrange time; (5).* Professor CARMAN, Assistant Professor QUICK, and Mr. CARPENTER.

Required: Mathematics 3 or 4.

3. INTRODUCTION TO PHYSICAL MEASUREMENTS.—Laboratory experiments running parallel with Physics 1, and required of the same students. The experiments are quantitative, illustrative of lectures, and introductory to more advanced laboratory work. *I. and II.; 3 periods, arrange time; (1½).* Assistant Professor QUICK and Mr. CARPENTER.

Required: Mathematics 3 or 4.

4. ELECTRICAL AND MAGNETIC MEASUREMENTS.—Lecture and laboratory course in the theory and use of electrical and magnetic measuring instruments. *I. and II.; Lecture, Tu., Th., 6; Laboratory, arrange time; (4).* Assistant Professor SAGER.

Required: Physics 1, 3; Mathematics 9.

5. ADVANCED PHYSICAL MEASUREMENTS.—A laboratory course, supplemented by lectures. This course presupposes Physics 1 and 3, or equivalents. *I. and II.; arrange time; (3 or 5).* Professor CARMAN and Assistant Professor SAGER.

Required: Physics 1, 3; Mathematics 9 desired.

6. INTRODUCTION TO THEORETICAL PHYSICS.—A course of lectures and recitations on dynamics, thermodynamics, and the theory of optics and of electricity and magnetism. *I. and II.; M., W., F.; 6; (3).* Professor CARMAN and Assistant Professor SAGER.

Required: Physics 1, 3; Mathematics 9.

7. INVESTIGATION OF SPECIAL PROBLEMS.—An advanced laboratory course in continuation of Physics 5. The student is given one or more special subjects of investigation to be conducted under the direction of the professors of the department. The machine shop of the department makes possible special and original apparatus. *I. and II.; arrange time; (3).* Professor CARMAN and Assistant Professor SAGER.

Required: Physics 4 or 5, or equivalent.

8. MATHEMATICAL PHYSICS.—A course of lectures and recitations. The subjects treated are changed each year, and are chosen to cover the general subject in two consecutive years, each year being complete in itself. The electromagnetic theory of light is the special subject for 1899-1900. *I. and II.; arrange time; (3).* Professor CARMAN.

Required: Physics 5 or 6.

9. Advanced Electrical Measurements.—A course in the theory and practice of the calibration of electrical measuring instruments, using the potentiometer and other standard methods. *II.; arrange time; (1).* Assistant Professor Sager.

Required: Physics 4.

10. Introduction to Electrical Measurements.—A course for sophomore electrical engineering students. *II; last nine weeks; arrange time; (1).* Professor Carman and Assistant Professors Sager and Quick.

Required: Physics 1, 3, for first semester.

GRADUATE COURSES

101. Advanced Physical Measurements and Investigation.

102. Mathematical Physics.

103. Mathematical Theory of Electricity and Magnetism for Engineers.

PHYSIOGRAPHY

1. Physiography.—Three objects are aimed at in this course, viz.: To promote the change in the method of teaching geography so generally advocated in recent years, to provide a rational basis for the study of geographic distribution of animals and plants, to place in their proper light the geographic factors in the history of man and his present well being.

The first part of the semester is devoted to a discussion of the general principles of meteorology, oceanography, and climatology. This is followed by a study of the physical geography of North America and Europe, with reference to the objects named above.

It is assumed that the student has a good understanding of political geography, and of the principles of land development, etc., as set forth in such works as Davis's Physical Geography, Mill's Realm of Nature, or Tarr's Physical Geography. *II.; daily; 6-8; (5).* Professor Rolfe and Mr. Hubbard.

Required: Geology 1 or 3, or an entrance credit in Geology.

PHYSIOLOGY

1. Major Course.—This course is founded on the previous thorough training of the student in physics, chemistry, and zoölogy. The course is designed primarily to prepare those taking it to enter upon the study of medicine. The work begins with a comprehensive study of the microscopic structure of the tissues in general, and later includes the structure of the organs in particular, with special

relation to their functions. The course, together with courses in chemistry recommended for prospective medical students, will complete a very thorough study of physiological chemistry, so far as it relates to the normal composition and functions of the organs and excretions. Frequent demonstrations in experimental physiology are given before the class, and the student is required to perform a number of such experiments under the immediate direction of the instructor. In addition, the students, working in small groups, will be required to perform assigned experiments, and to submit their records and data for examination and criticism. Practical laboratory work is insisted on throughout. *I. and II.; daily; 3; (5 each semester).* Professor KEMP.

Required: Physics 1, 3; Chemistry 1, 2, 3a, 5a, 9, 9c; Zoölogy 2.

2. ADVANCED COURSE.—Continuation of Physiology 1 through a second year. This course is designed for students who wish to get as thorough a training as possible for the study of medicine, and who can afford to take the full science course at the University leading to the B.S. degree. The work will be made up of lectures, assigned reading, and experiments in the laboratory conducted by the students themselves, under the supervision of the instructor. Course 1 will necessarily give but a limited opportunity for such personal work on the part of the student. Course 2 will enable him to have a fair degree of experience with methods and apparatus used in the most advanced lines of medical study. *I. and II; daily; 3; (5 each semester).* Professor KEMP.

3. INVESTIGATION AND THESIS.—The laboratory of the physiological department is well equipped with instruments of precision for research in histology, physiological chemistry, experimental physiology, and pharmacology. Every facility and encouragement, so far as the resources of the laboratory permit, are offered to those prepared to avail themselves of these for researches leading to theses for the bachelor's, master's, or doctor's degree, or for carrying on original work for publication.

4. MINOR COURSE.—This course is planned for literary students and for students of natural science specializing in other lines. Especial emphasis is laid upon those facts that serve as a basis for practical hygiene, and for helping students to teach physiology in high schools. It will consist of lecture demonstrations, recitations, and laboratory work. Students who have had chemistry or zoölogy in high schools may be admitted to the course at the option of the instructors. *II.; daily; 7; (5).* Professor KEMP.

Required: Chemistry 1; Zoölogy 10.

5. ADVANCED PHYSIOLOGY.—There are here included the following lines of laboratory work, any one or more of which may be pursued independently of the others: (a) The physiology of foods, and digestion; (b) the blood, circulation, and respiration; (c) the excretions, especially urine-analysis; (d) general physiology of nerve and muscle; (e) advanced vertebrate, especially human, histology. Work to be arranged after consultation with Professor KEMP.

6. HYGIENE.—This course is offered to both men and women, and must be taken by young women who take physical training for credit. It is designed to impart a knowledge of the conditions of bodily health and activity. The course deals with those practical hygienic problems of everyday life that are wholly or in large part under the control of each individual. *I.; M.; 8; (1).* Professor KEMP.

PSYCHOLOGY

1. GENERAL ELEMENTARY PSYCHOLOGY.—This course begins with a detailed study of the anatomy and physiology of the sense organs and central nervous system. This is followed by an experimental and descriptive study of the higher mental functions. Laboratory work forms a prominent feature of the course. *II.; daily; 1; (5).* Assistant Professor HYLAN.

Required: At least one year of University work.

2. EXPERIMENTAL PSYCHOLOGY.—The object of this course is to give the student an acquaintance with the normal psychical phenomena. About one hundred experiments are performed in sensation and perception, followed by experimental studies of attention, memory, association, emotion, and volition. Each student is required to keep a careful record, in notes and drawings, of the experiments performed, and to become familiar with the literature. *I.; daily; 7; (5).* Assistant Professor HYLAN.

Required: Psychology 1 or 4.

3. COMPARATIVE PSYCHOLOGY.—In this course the development of mind is traced through the animal scale. The higher forms of mental development are correlated with the mental activities of the child and the savage. Special laboratory facilities are accessible for the study of chicks, frogs, protozoa etc., and experimental work is continued throughout the course. *Romanes and Lloyd Morgan,* with studies in anthropology and child life. *II.; daily; 7; (3).* Assistant Professor HYLAN.

Required: Psychology 1 or 4.

4. Educational Psychology.—This course aims to apply the principles and resources of modern psychology to the needs of the teacher. Memory, attention, imagination, emotion, and will are analyzed, and the methods of their cultivation and control treated. Tests of the sense organs and of mental ability, and the principles of economy and mental hygiene, are taken up. Also the systematic observation of children, mental development and its physiological accompaniments, the child's instincts, emotions, and social relations. The course is amply illustrated by views, drawings, apparatus, and experiments. *I; daily; 1; (5).* Assistant Professor Hylan.

Required: At least one year of University work.

5. Psychological Seminary.—It is the plan of this course to take up the work of contemporary psychologists more exhaustively than is provided for in other courses. The work is preceded by a systematic study of the history of psychology, beginning with Hobbes, and the development of the various phases of the subject is traced to the present time. A knowledge of the history of modern philosophy will be found a valuable preparation. *I. and II.; arrange for two hours a week; (4 each semester).* Assistant Professor Hylan.

COURSE FOR GRADUATES

101. Research Course.—Though primarily for graduates, the course may be taken by seniors who give evidence of suitable preparation. If laboratory work, it must be preceded by Psychology 1 and 2. For other than laboratory work, the required preparation will depend upon the subject.

PUBLIC LAW AND ADMINISTRATION

1. Political Institutions.—Comparative study of modern political systems, their historical development and practical operation. Lectures, assigned readings, reports, and discussions. The first semester is devoted to the leading features of national and state government of the United States; in the second semester the governments of the leading European states are studied. In connection with History 2 this course makes a full study running through the year. (See announcement under History 2.) *I. and II.; M., W., F.; 2; (3).* Assistant Professor Tooke.

2. Jurisprudence.—Elementary course in the origin, development, and classification of law, followed by an introduction to the fundamental principles of the English Common Law. *I. and II; Tu., Th.; 3; (2).* Assistant Professor Tooke.

3. ROMAN LAW.—Early history. The classical jurisprudence. Legislation of Justinian. Influence of the Roman system. Readings and lectures. *I.; Tu., Th.; 3; (2). First semester, 2 hours.* Assistant Professor TOOKE.

Required: A reading knowledge of Latin.

4. INTERNATIONAL LAW.—Sources and historical development. Essential powers of states, their rights and their obligations. Laws and usage in time of war. Topics in American diplomacy. *II.; Tu., Th.; 1; (3).* Assistant Professor TOOKE.

Required: Public Law and Administration 1.

5. COMPARATIVE ADMINISTRATIVE LAW.—General principles of administrative law of the United States (national and commonwealth), England, France, and Germany. The appointment, tenure, and duties of officers. Historical and comparative study of local government. *I. and II.; M., W., F.; 3; (3).* Assistant Professor TOOKE.

Required: Public Law and Administration 1 and 2. [Not given in 1899-1900.]

6. COMPARATIVE CONSTITUTIONAL LAW.—The first semester is devoted to a study of American Constitutional law; the work of the second semester is a comparative study from original sources of the constitutions of the leading European states. *I. and II.; M., W., F.; 3; (3).* Assistant Professor TOOKE.

Required: Public Law and Administration 1 and 2.

7. MUNICIPAL CORPORATIONS.—History and legal status of the American municipality. To supplement course 5. *II.; Tu., Th.; 2; (2).* Assistant Professor TOOKE. [Not given in 1899-1900.]

9. SEMINARY IN MUNICIPAL INSTITUTIONS.—Open to graduates and seniors. *I. and II; arrange time; (2).* Assistant Professor TOOKE.

RAILWAY ENGINEERING

1. LOCOMOTIVE ENGINES.—This work is a study of the constructive features of the locomotive in all its parts, a special study of types is made with reference to relations between boiler capacity, size of cylinder, and weight on drivers for maximum speed or hauling capacity. Includes also a study of all accessory apparatus used in the operation of the locomotive. *I.; Tu., Th.; 1; (2).*

2. LOCOMOTIVE ENGINE DESIGN.—The proportions and dimensions of standard locomotives are carefully studied. Calculations and designs, relating to boiler and engine details, cylinder proportions

for compound types of slide, valves and valve gears. *I.; Tu., W., Th.; 2, 3, and 4; (3).*

3. Shop Systems.—Lectures and readings. A study of the proceedings of the societies and railway clubs. The technical press and visits of inspection. *I.; Tu., Th.; 6, 7, and 8; (2).*

4. Locomotive Road Tests.—Arrangements for locomotive road tests have been perfected with several roads entering Champaign and Urbana. Already five locomotives have been equipped for this work and tests made in actual service conditions. This work is greatly facilitated by the use of the dynamometer car which is now at the service of the department. The laboratory work of the course is largely along this line. *I.; M., W.; arrange time; (4).*

5. Compressed Air in Railway Service.—This will include a careful study of the construction and operation of the air-brake system in detail. The air-brake instruction cars of the I. C. R. R. and the C. C. C. & St. Louis Ry. make frequent stops at these points, and the instructors in charge kindly devote sufficient time to illustrate and explain the operation of the air-brake.

The use of compressed air in shop service is also studied. *I.; M.; 2; (1).*

6. Railway Estimates.—A study of costs of materials and repairs. Forms of specifications for supplies. Costs of operating foreign and American practice compared. *II.; Tu., Th.; 2, 3, and 4; (2).*

7. Advanced Designing.—Under this head attention will be paid to details of rolling stock, pumps, gas, and oil engines for water supply. Special machinery for repair shop service, turn tables, and advanced problems relating to locomotive design. *II.; Tu., W., Th.; 6, 7, and 8; (3).*

8. Dynamometer Car Tests.—Investigations will the made under actual road conditions relating to hauling capacity of engines, train resistance, due to acceleration, grades, curves, and wind pressure. Air-brake service inspections. Automatic records of track conditions as to alignment, gauge surface, joints, and elevation of rails. Tests at stationary plants and railway shops will be made.

Arrangements for careful and scientific sampling of fuels, boiler waters, oils, paints, varnishes, and railway supplies for analysis and tests will be included in this work. *II.; M., F.; arrange time; (2).*

RHETORIC AND ORATORY

1. Rhetoric and Themes.—Required for students in the College of Literature and Arts. *I. and II.; M., W., F.; sections at 1, 3, and 7; (3).* Assistant Professor T. A. Clark and Miss Cook.

2. Rhetoric and Themes.—Required for students in the Colleges of Agriculture, Science, and Engineering. *I. and II.; M., W., F.; sections at 1, 2, and 3; (3).* Miss Kyle.

3. Higher English Composition.—Short daily themes with longer exercises every fortnight. *I. and II.; M., W., F.; sections at 2, 4; (5).* Assistant Professor T. A. Clark.
Required: Rhetoric and Public Speaking 1 or 2.

4. Argumentative Composition.—Lectures and text-book work on the principles of argumentative discourse. Weekly practice in the preparation of briefs, and in the writing and delivery of forensics. *I. and II.; M., W., F.; 5; (3).*
Required: Rhetoric and Oratory 1 or 2.

5. Oral Discussions.—The collection and arrangement of data for discussions. Frequent oral debates, with special attention given to good methods of delivery. *I. and II.; Tu., Th.; 5; (2).*
Required: Rhetoric and Oratory 1 or 2.

SOCIOLOGY

[See under Anthropology and Economics, pp. 170, 195.]

SPANISH

1. Grammar and Reading.—Edgren's Spanish Grammar; Knapp's Spanish Readings; Cervantes' Don Quijote; outlines of Spanish literature. *I. and II.; arrange time; (3).* Assistant Professor Fairfield.

THEORETICAL AND APPLIED MECHANICS

[See Mechanics, p. 226.]

VETERINARY SCIENCE

1. Anatomy and Physiology.—The anatomy and physiology of the domestic animals, diseases of the bony structure and lameness. The instruction is given by lectures aided by demonstrations with use of skeletons, and of other apparatus, as follows: Dr. Auzoux's complete model of the horse, which is in ninety-seven pieces and exhibits

three thousand details of structure; *papier-maché* model of the horse's foot; the teeth of the horse; and dissections of animals. This work is supplemented with the study of text books. Strangeway's Veterinary Anatomy, Mills's Animal Physiology, and Diseases of Horses and Cattle. *II.; daily; 4; (5).* Professor McINTOSH.

2. PRINCIPLES AND PRACTICE OF VETERINARY MEDICINE.—This subject is taught by lectures and text-books on the diseases of domestic animals, and is illustrated with specimens of morbid anatomy and by observations and practice at the free clinics. The latter are held at the Veterinary Infirmary once a week. The students assist in the operations, and thus obtain a practical knowledge of the subject. Dissections and *post-mortem* examinations are made as cases present themselves. Text-books, Diseases of Horses and Cattle, by D. McIntosh, and Williams's Practice of Veterinary Medicine and Surgery. *I.; daily; 4; (5).* Professor McINTOSH.

3. VETERINARY MATERIA MEDICA.—This subject, which treats of the agents for the cure of disease or injury, and for the preservation of health among domestic animals, is taught by lectures and text-books, illustrated by specimens of the drugs used in veterinary practice. The compounding of medicines also receives attention. Textbooks: Finlay Dun's Veterinary Materia Medica. *I. and II.; daily; 3; (5).* Professor McINTOSH.

ZOÖLOGY

1. GENERAL INVERTEBRATE ZOÖLOGY.—The work here described is so related to Zoölogy 2 that both form a continuous course of a year, either semester of which may be taken first. Commonly, however, Zoölogy 1 should be taken in the freshman year, preceding Zoölogy 2. It is devoted especially to a series of laboratorv studies of invertebrate types, and to lectures on the morphology, physiology, and relations to nature, of this selected series, and on cytology and general zoölogical theory. *II.; Lecture, M. W., F.; 3; Laboratory 7 periods; arrange time; (5).* Assistant Professor SMITH.

Required: Art and Design 1, an entrance credit in chemistry or Chemistry 1, an entrance credit in zoölogy or Biology 1 or Zoölogy 5.

2. VERTEBRATE ZOÖLOGY AND COMPARATIVE ANATOMY.—In the laboratory work of this course principal attention will be given to the anatomy of Necturus and to anatomical and systematic studies of fishes, birds, and mammals, especial reference being had to the anatomy of man. The more difficult parts of laboratory technology will

be given in this course, which will also contain lectures on the general theory of organic development as illustrated by the doctrine of the descent of man. *I.; daily; 4, 5; (5). First semester.* Assistant Professor SMITH.

Required: Biology 1, or Zoölogy 1.

3. EMBRYOLOGY.—This course begins with a study of the sex cells and a discussion of theories of heredity, followed by a consideration of the early stages in the development of the egg. The formation of the vertebrate body is then studied in the amphibian, the chick, and the pig. Instruction is given in the preparation of embryological material and in graphic reconstruction from serial sections. *II.; daily; 2 and 3; (5).* Assistant Professor KOFOID.

Required: Zoölogy 2.

4. ADVANCED ZOÖLOGY.—Under this head is offered an opportunity for individual advanced work for one or two semesters along lines to be selected in consultation with the instructor. This may include field zoölogy, but is essentially a research course for students specializing in zoölogy. One semester of this course or zoölogy 6 will be required of all intending to graduate with a zoölogical thesis. Students in this course will commonly be assembled as a class only for seminary work. *I. and II.; arrange time; (5 each semester).* Professor FORBES, or Assistant Professor SMITH.

Required: Zoölogy 1 and 2.

5. ELEMENTARY ENTOMOLOGY.—This is a laboratory and lecture course in general entomology, open to all University students, pursued without especial reference to economic ends, complete in itself, but leading to the course in general entomology (Zoölogy 6). The laboratory work is strictly entomological, but the lecture course is in great measure a course in general biology, with entomological illustrations. *I.; daily; 1 and 2; (5).* Professor FORBES.

6. GENERAL ENTOMOLOGY.—This is a course of two semesters, the work in either of which may be taken separately, offered to students who have had a sufficient amount of elementary zoölogy as a preparation. It comprises laboratory and library studies, field work, insectary work, field observation, the collection and preservation of specimens, and the preparation and illustration of manuscript. Special instruction is given in this course in the art of entomologica. illustration under the supervision of an expert zoölogical artist. This course, or one semester of zoölogy 4, will be required of all intending to graduate with a zoölogical thesis. *I. and II.; daily; 3 and 4; (5).* Professor FORBES.

Required: Zoölogy 1 or 5.

7. Practical Entomology.—By means of laboratory studies and lectures and field and insectary observations, students will be made familiar with the commonest and most important injurious insects, and with means of preventing or arresting their injuries. *I. and II.; daily; 6 and 7; (5).* Professor Forbes.

8. Thesis Investigation.—Candidates for graduation in the College of Science who select a zoölogical subject as a thesis are required to spend three hours a day during their senior vear in making an investigation of some selected zoölogical subject. While this work is done under the general supervision of an instructor, it is in its methods and responsibilities essentially original work. *I. and II.; daily; arrange time; (5).* Professor Forbes and Assistant Professor Kofoid.

Required: Two years in zoölogical courses, including one semester of zoölogy 4.

COURSES FOR GRADUATES

101. Systematic and Faunistic Zoölogy.—This course consists of studies of invertebrate animals (including insects), and of aquatic vertebrates, so directed as to give as nearly as possible an exhaustive knowledge of a taxonomic group or of a selected geographic assemblage. If a suitable taxonomic group is chosen, its space and number relations within a definite area will be thoroughly worked out by the precise methods of modern faunistic zoölogy, including quantitative collections made by uniform methods at regular periods, and the comparative measurement or enumeration of such collections. If a geographic assemblage be selected, critical determinative work will be followed by both qualitative and quantitative studies of the various groups associated, with a view to accumulating data for an examination of the interactions of the assemblage.

102. Advanced Economic Entomology.—This is a research course in systematic and experimental entomology which involves the application to insects injurious to agriculture and horticulture of the methods and general ideas of the preceding course. It is intended to prepare students in a thoroughgoing manner for first-class investigation work in this field, and for the direction of entomological operations in agricultural experiment stations.

DEGREES

BACHELORS' DEGREES

The usual bachelors' degrees are conferred upon those who satisfactorily complete the courses of study described under the different colleges and schools. A candidate for a bachelor's degree must pass in the subjects marked *prescribed* in his chosen course, and must conform to the directions given in connection with that course in regard to electives. In the College of Literature and Arts, of Science, and of Agriculture, credit for 130 hours is required for graduation. In the College of Engineering and in the schools the candidate must complete the course of study as laid down. The number of hours required includes five in military science, and two and one-half in physical training, for men, and for women three in physical training. Men excused from the military requirements, and women who do not take courses in physical training, must elect in lieu thereof an equivalent number of hours in other subjects.

In all cases in which a thesis is required,* the subject must be announced not later than the first Monday in November, and the completed thesis must be submitted to the dean of the proper college by June 1st. The work must be done under the direction of the professor in whose department the subject naturally belongs, and must be in the line of the course of study for which a degree is expected. The thesis must be presented upon regulation paper, and will be deposited in the library of the University.

1. The degree of Bachelor of Arts is conferred on those who complete a course in the College of Literature and Arts.

2. The degree of Bachelor of Science is conferred on

*See requirements for graduation in the different colleges.

those who complete a course in the College of Engineering, of Science, or of Agriculture. The name of the course will be inserted in the diploma.

3. The degree of Bachelor of Law is conferred on those who complete the course in the School of Law.

4. The degree of Doctor of Medicine is conferred on those who complete the course in the School of Medicine.

5. The degree of Bachelor of Library Science is conferred on those who complete the course in the School of Library Science.

6. The degree of Bachelor of Music is conferred on those who complete one of the courses in the School of Music.

7. The degree of Graduate in Pharmacy is conferred upon those who have satisfied the requirements therefor in the School of Pharmacy.

ADVANCED DEGREES

No degrees are given for study *in absentia,* except that graduates of this University, who become members of the Graduate School and reside elsewhere, may receive a second degree, upon the completion of their courses of study within not less than three years of the date of registration. For a graduate of this University who has won recognized distinction in a special line of investigation, and who otherwise fulfills the conditions for a doctor's degree, the requirement of residence for that degree will be such as may be imposed by the General Faculty of the University, on presentation of the case by the Council of Administration. Advanced degrees are conferred by the Trustees of the University only upon recommendation of the General Faculty, based upon information furnished by the Council of Administration.

SECOND DEGREES

The second degrees conferred by this University are as follows:

Master of Arts, after Bachelor of Arts.

Master of Science, after Bachelor of Science in courses of the colleges of Agriculture and Science.

Master of Architecture, after Bachelor of Science in courses in Architecture and Architectural Engineering.

Master of Laws, after Bachelor of Laws, in the School of Law.

Master of Library Science, after Bachelor of Library Science.

Civil Engineer, after Bachelor of Science in the course in Civil Engineering.

Electrical Engineer, after Bachelor of Science in the course in Electrical Engineering.

Mechanical Engineer, after Bachelor of Science in the course in Mechanical Engineering.

Pharmaceutical Chemist, after Graduate in Pharmacy.

Graduates of other colleges and universities which have equivalent requirements for baccalaureate degrees may be given second degrees determined in kind by comparison with the usage described above.

All candidates for second degrees are required to register in the Graduate School; to conform to the conditions outlined under "Admission," "Registration," and "Examinations" (pp. 146 and 147); to pursue an approved course of study for one academic year in residence, or, in the case of graduates of this University, for three years *in absentia;* and to pass satisfactory examinations upon all the studies of the approved course.

Each candidate for a second degree must present an acceptable thesis in the line of his major subject of study. The subject of this thesis must be announced to the Dean of the General Faculty not later than the first Monday in November of the academic year in which the course is to be completed. The completed thesis, upon regulation paper, must be presented, with the certified approval of the professor in charge, to the Council of Administration not later than June 1st.

The period of required study begins from the date of registration in the Graduate School.

DOCTOR'S DEGREE

The degree of Doctor of Philosophy, or Doctor of Science, may be conferred upon any member of the Graduate School of not less than three years' standing who shall have reached high attainments in scholarship, including a sufficient knowledge of the Latin, French, and German languages to serve the purposes of research in his principal specialty, who shall have shown marked ability in some line of literary or scientific investigation, and shall have presented a thesis giving clear indications of such scholarship and of such power of research. At least the first two, or the last one, of the three years of study must be in residence at the University, and the entire course of study must be in accordance with the regulations of the Graduate School.

The time and study required for a master's degree may be included in the three years required, but approval of a course of study for a doctor's degree must be upon the condition that the candidate is prepared through his baccalaureate work, or otherwise, to enter at once upon advanced studies in the line of this major subject, and that work on this major subject be continued through the three years.

The final examination of a candidate for the doctor's degree is conducted by a committee consisting of the head of the department under which the major subject has been pursued, as chairman, and of not less than two additional members of the General Faculty of the University, appointed for the purpose by the Council of Administration. This examination covers the subjects of the course approved for the degree, but is specially searching upon that on which the major work has been done. This examination occurs in the week preceding that upon which commencement day occurs.

Each candidate for a doctor's degree must announce to the Dean of the General Faculty a thesis subject not later than the first Monday in November of the academic year at the close of which the award of the degree is expected. A fair copy of the thesis must be submitted, with a certified approval of the committee on examinations, to the Council of Administration not later than the first day of June. If the thesis is approved by the Council the candidate must have it printed and must deposit not less than one hundred copies with the librarian of the University.

FELLOWSHIPS

The Trustees of the University have established eight fellowships, each with a stipend of three hundred dollars, payable in ten monthly installments.

The rules governing appointments to these fellowships are as follows:

1. The purpose of these fellowships shall be to promote advanced scholarship and original research in the University.

2. The fellowships shall be open to graduates of this and similar institutions. Those who are to complete an under-graduate course previous to the academic year for which appointments are made shall be eligible, with others, as candidates.

3. Nominations to fellowships, accompanied by assignments to special departments of the University for instructional work, shall be made by the Council of Administration to the Trustees of the University, upon applications received by the President of the University each year, not later than the twenty-fifth day of April. These nominations shall be made at a meeting of the Council called for that purpose within the month of May. The appointments by the Trustees are made at their regular meeting in June, and shall take effect the first day of the following September. Vacancies may be filled by similar nominations and appointments at other times.

4. Nominations to fellowships shall be made upon the grounds of worthiness of character, scholastic attainments, and promise of success in the principal line of study

or research to which the candidate proposes to devote himself. Consideration shall also be given to the probable value or usefulness of the services of the candidate as an assistant in instruction, but this shall not be deemed the primary object of the appointment. Other things being equal, preference shall be given to those graduates of this University who have pursued a specialized course.*

5. Candidates must present, with their applications, full information concerning themselves and their qualifications for advanced study and research work, including any written or printed essays or results of investigation, and must name the subject in which they wish to do their major work.

6. Fellowships shall be good for one year. Appointments may not be usually renewed to the same persons, and in no case for more than one additional year; but an appointment as *honorary fellow*, without stipend, may be made as specified for paid fellowships in the case of any one who has held a regular fellowship and has shown distinguished merit in his work.

7. Fellows shall be constituted members of the Graduate School, shall have all of the privileges and bear all of the responsibilities of such membership. Each regular fellow may be called upon to render service in instruction throughout the year in the department in which his major subject lies, equal to one hour daily of class instruction or to two hours daily of laboratory supervision. This service will receive such credit as the Council of Administration may determine in each case. Blank forms for application may be obtained by addressing the Registrar.

*See pp. 62 and 119. All members of the Colleges of Engineering and of Agriculture, of the chemical and mathematical groups in the College of Science, and of the Schools of Law, Library Science and Music, are considered as pursuing specialized courses.

SCHOLARSHIPS

STATE*

A law passed by the General Assembly of the State of Illinois at the session of 1895 provides that there shall be awarded annually to each county of the state one state scholarship, which shall entitle the holder thereof, who shall be a resident of the senatorial district to which he is accredited, to instruction in any or all departments of the University of Illinois for a term of four years, free from any charge for tuition or any incidental charge, unless such incidental charge shall have been made for materials used or for damages needlessly done to property of the University; *Provided,* that in counties having two or more senatorial districts there shall be awarded annually one additional scholarship for each of said senatorial districts.

A competitive examination under the direction of the Superintendent of Public Instruction shall be held at the county courthouse in each county of the state upon the first Saturday of June in each and every year by the county superintendent of schools upon such branches of study as said Superintendent of Public Instruction and the President of said University may deem best.

Questions for such examinations shall be prepared and furnished by the President of the University to the Superintendent of Public Instruction, who shall attend to the printing and distribution thereof to the several county superintendents of schools prior to such examinations.

The law also provides that in case the scholarship in any county is not claimed by a resident of that county, the Superintendent of Public Instruction may fill the same by appointing some candidate first entitled to a vacancy in some other county.

Candidates to be eligible to a state scholarship must be at least sixteen years of age, and must have been residents

*These scholarships replace the honorary scholarships and the accredited school scholarships heretofore given.

of their respective counties for the year preceding the examination.

A student holding a state scholarship who shall make it appear to the satisfaction of the President of the University that he requires leave of absence for the purpose of earning funds to defray his expenses while in attendance may, in the discretion of the President, be granted such a leave of absence, and may be allowed a period not exceeding six years from the commencement thereof for the completion of his course at said University.

The law contemplates that the candidate who passes this competitive examination should afterward pass the regular entrance examination to the University. It has been thought best to combine these examinations so that the successful candidate may be admitted to the University without further examination. To this end the examination will be held on the first Saturday in June and the Friday preceding (June 2 and 3, 1899, and June 1 and 2, 1900). The subjects for examination will be the same as stated under the head of "Admission by Examination," p. 42.

Any person, whether a candidate for a scholarship or not, may be examined for admission to the University at these state scholarship examinations.

MILITARY

Students who have gained 20 hours in class room military instruction and 20 in drill practice, are eligible for appointment as commissioned officers of the battalion. Those attaining this rank may be awarded special scholarships, good for one year, and equal in value to the University term fees for the same length of time.

PRIZES

THE HAZLETON PRIZE MEDAL

Capt. W. C. Hazleton provided in 1890 a medal, of beautiful and artistic design, which is to be awarded, at a competitive drill to be held near the close of the year, to the best drilled student. Each competitor must have been in attendance at the University at least sixteen weeks of the current college year; must not have had more than four unexcused absences from drill; and must present himself for competition in full uniform.

The award is made for excellence in these particulars:

1. Erectness of carriage, military appearance, and neatness.
2. Execution of the school of the soldier, without arms.
3. Manual of arms, with and without numbers.

The successful competitor will receive a certificate setting forth the facts, and may wear the medal until the 15th day of May following, when it will be returned for the next competition.

IN ORATORY

The Trustees of the University appropriate every year the sum of one hundred dollars for prizes in debate. The amount is divided into three prizes, of fifty, thirty, and twenty dollars, respectively, and these are awarded to the three participants whose work is adjudged best.

The debate is held some time in the month of February. A preliminary contest takes place in December, and is open to all members of the three upper classes. From the list of contestants in the preliminary debate six are selected to take part in the final competition.

INTERSCHOLASTIC ORATORICAL CONTEST

A medal of the value of twenty dollars is offered annually by the University to the high schools of the state for the best oration delivered in a competitive contest between their representatives. This contest takes place in the spring at the time of the interscholastic athletic meet.

BENEFICIARY AID

CHICAGO CLUB LOAN FUND

The Chicago Club of the University of Illinois offers two loans of $250.00 each, payable to the beneficiary, $100.00 the first year, $75.00 the second year, $50.00 the third year, and $25.00 the fourth year. The loans are offered to residents of Cook County, Illinois, only, and are to be awarded upon competitive examination to those obtaining the highest average grades. The loans are due six years after matriculation. They bear no interest while the students is in the University, but six per cent. after graduation. The examination questions are prepared at the University and cover the same subjects as those for the state scholarships.

The beneficiaries of this fund also have their incidental fees, amounting to $24.00 a year, remitted by the trustees.

CLASS OF 1895 LOAN FUND

This is a fund of $250.00, established by the class of 1895, to be loaned to needy and deserving students. According to the conditions of the gift, one-fifth of the amount is to be loaned annually, and is open to members of the freshman class only. No person may receive the benefit of the fund more than four years. The loan bears interest at the legal rate from the time the recipient leaves the University, and is due, one-half in five years, and one-half in six years, after matriculation. The management of the fund is in charge of the Council of Administration.

SOCIETIES AND CLUBS

LITERARY SOCIETIES

The Adelphic and Philomathean societies for men, and the Alethenai for women, occupy large halls, which the members have appropriately furnished and decorated. Meetings are held Friday evenings throughout term time.

THE CHRISTIAN ASSOCIATIONS

The YOUNG MEN'S and the YOUNG WOMEN'S CHRISTIAN ASSOCIATIONS are active and useful organizations, and have a large membership.

Subscriptions have been made by students and graduates, amounting to $23,000.00, toward a new building for these organizations. A canvass has been started outside with the hope of raising the sum to $32,000.00. If this is successful the building will be begun at once. An excellent site has been purchased.

CLUBS AUXILIARY TO COURSES OF STUDY

AGRICULTURAL CLUB

This club meets semi-monthly. It is devoted to the discussion of topics of theoretical and practical interest to students of agriculture. All students in the College of Agriculture are eligible to membership.

ARCHITECTS' CLUB

This club meets once in two weeks for the consideration of current topics of architectural interest and subjects connected with the study of architectural history. All students pursuing architectural studies are eligible to membership.

CIVIL ENGINEERING CLUB

This club meets the second and fourth Saturday evenings of each month for the reading and discussion of papers relating to civil engineering. All students pursuing the civil engineering course may become members.

THE ENGLISH CLUB

The English Club is composed of members of the Faculty, and of students who have done especially good work in English. The work of the club is confined to the study of recent writers of fiction and of poetry. The membership is limited to thirty. Meetings are held on the second Monday of each month.

FRENCH CLUB

Le Cercle Français includes students who have had at least one year's work in French. The club meets once a month throughout the year. Its proceedings are conducted in French, the object being to supplement the work of the class room by the practical handling and understanding of the language.

THE LATIN CLUB

This is an organization for the purpose of promoting interest in the language and institutions of the Roman world. It meets once in two weeks.

LIBRARY CLUB

The library staff and the Library School have organized a Library Club which meets once in three weeks throughout the college year. The club considers literary topics which are allied to the library work, but does not deal with the technical subjects which are included in the library school course.

MECHANICAL AND ELECTRICAL ENGINEERING SOCIETY

This club meets on the first and third Saturday evenings of each month. All students pursuing mechanical and electrical engineering studies are eligible to membership. Papers relating to subjects of interest to members are presented and discussed at each meeting.

MEDICAL CLUB

The Medical Club is composed of students, irrespective of courses and departments, who are preparing for medical study, or who are for any reason interested in medical subjects. Its programs consist of lectures by members of the biological faculty and by physicians, and of papers prepared by members of the club. It meets weekly.

MUSICAL CLUBS

These are described under the School of Music.

ZOÖLOGICAL CLUB

The University Zoölogical Club is composed of advanced students and instructors in the zoölogical and physiological departments, together with such other biological instructors and advanced students as are interested in its subjects. Its sessions are devoted to the presentation and discussion of abstracts of recent biological literature and of the results of investigation by the members of the club. It meets weekly in Natural History Hall.

MILITARY SCIENCE

The military instruction is under the charge of a graduate of the U. S. Military Academy and officer of the regular army of the United States. The course as a whole has special reference to the duties of officers of the line. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, and two field pieces of artillery.

Every male student able to perform military duty, and not excused for sufficient cause, is required to drill twice each week until he has gained credit for 20 semester hours. He is also required to study Drill Regulations for Infantry and to recite upon the same once a week until he gains credit for one semester hour. This practical instruction begins as soon as possible after he enters the University; but a preparatory student carrying no freshman studies and not expecting to matriculate during the year, is not permitted to drill. The standings in study and drill are placed on record, with other class credits; one semester of recitations and drill count two hours, and the three remaining semesters of drill three hours, and are requisite to graduation in every University course.

Appointments in the battalion are made on nomination by the professor in charge and confirmation by the Faculty.

Students who have passed two examinations in the drill regulations and have gained 5 hours' credit in drill practice are eligible for corporals; those having 10 hours' credit in each are eligible for sergeants; and those having 20 hours' credit in each, for lieutenants and for officers of higher rank.

The battalion (four companies) is composed mainly of the members of the freshman and sophomore classes, the first supplying the corporals, the second, the sergeants. The lieutenants are taken from those of the junior class, and the major and captains from those of the senior class, who have passed through the lower grades satisfactorily.

A special military scholarship, good for one year, is open to each student who attains the grade of a commissioned officer, the value of which is paid the holder at the close of the year.

An artillery detachment is organized mainly from the second year, or sophomore, class, which receives practical instruction twice each week during the college year.

Toward the close of the year, a committee appointed by the Faculty examines candidates for nomination to the Governor of the state to receive commissions as brevet captains in the state militia. Candidates must be members of the senior class in full standing at the time of this examination; must have completed the course of military studies; must have served three terms as captains or lieutenants, and must be approved by the Faculty as having good reputations as scholars, officers, and gentlemen.

Under the authority of the acts of incorporation, the Trustees have prescribed a uniform of cadet gray, coat trimmed with black mohair braid, trousers with black cloth stripe, cut after the U. S. army pattern. The uniform of the cadet officers is of dark blue cloth for coat and light blue for trousers; cap, for all, of dark blue cloth, army pattern, with university badge embroidered thereon in gold bullion; white gloves; the uniform of the band dark blue throughout, with special trimmings.

In order that all uniforms worn at this University may be, in quality, make, and finish in strict accordance with the specifications adopted by the Board of Trustees, all students enrolled in the military department will be required to obtain them from that firm only that may, for the time being, be under agreement and bond with the Trustees to furnish said uniforms at a stated price and of standard quality.

The University Cornet Band is composed of students, and every full term of service therein is counted as one term of drill.

PHYSICAL TRAINING FOR MEN

The main object of the work of this department is to preserve the bodily health of the students by careful physical examinations, and rational prescriptions of exercises; by correcting physical deformities, and imperfect development; by teaching proper methods of living; and by encouraging proper intercollegiate sports.

Each student is required to undergo a physical examination so that a correct knowledge of his bodily condition may be obtained, and proper exercises prescribed. Regular classes are formed for drill on the various gymnasium appliances. Lectures are given upon personal hygiene.

All competitive athletic games are under the direct supervision of the professor of physical training, and his medical examination is required to show that membership on any team will tend to improve the physical condition, and not cause injury.

Two courses are offered to those who wish to prepare as instructors of physical training or coaches of athletic teams.

FOR WOMEN

Each student who takes physical instruction is expected to undergo a physical examination every year, in order that her physical condition may be known and suitable exercises and advice given. Systematic class work is given in the use of dumb-bells, wands, bar-bells, foils, Indian clubs, and on many pieces of gymnastic apparatus.

Throughout the fall and spring out-door games and exercises receive considerable attention. Lectures and talks on hygiene, physical training, etc., are given during the winter.

Each student comes under the personal observation of the director and is given exercises to meet her special needs.

Every woman student not physically disqualified must take the prescribed work and may elect enough to make seven hours of credit.

The women's gymnasium occupies very attractive quarters in Natural History Hall, and is well equipped. The pastime grounds near by, in use through the year, when the weather permits, have a sixteen-lap running track, eight tennis courts, two basket ball fields, and space for hurdling, handball, and other suitable amusements.

The gymnasium is open for exercise, at certain hours, under suitable restrictions, to those who are not enrolled in classes.

EXPENSES

BOARD

The University does not furnish board, but there is a large number of suitable private places in Urbana and Champaign, within walking distance of the University, and easily accessible by electric railway, where students can obtain table board and rooms. There are several students' clubs at which the cost of meals is about two and a half dollars a week.

The Business Manager and the Young Men's and Young Women's Christian Associations of the University will aid new students in procuring rooms and boarding places.

FEES

Technological, Scientific, Agricultural, and Literary Departments.

MATRICULATION FEE. Each student not holding a scholarship, upon satisfying the requirements for admission to the University, pays the matriculation fee of................	$10 00
THE DIPLOMA FEE, payable before graduation, is.............	5 00
THE INCIDENTAL FEE. All students, except those in the Graduate School, pay, each semester, an incidental fee of.	12 00
TUITION FEE. Students "conditioned" on entrance requirements and "Special" students (see p. 51) pay, each semester, a tuition fee of.............................	7 50

LABORATORY FEES AND DEPOSITS. Each student working in laboratories, or in the drafting or engineering classes, is required to make a deposit varying from 50 cents to $10.00, to pay for chemicals and apparatus used, and for any breakages or damages.

The deposit for Library School supplies is $20.00 for the junior year, and $10.00 for the senior year.

Music Department

Students who are candidates for a degree in the music department pay the matriculation fee of	$10 00
Students in the music department taking studies in other departments of the University pay the "incidental" fee each semester	12 00
They also, if not matriculated, pay, each semester, the tuition fee of	7 50

Students not enrolled in other departments, and so not paying the "incidental" fee, pay special music fees as follows:

Piano, organ, or voice, two lessons a week, each semester	$ 32 50
Same, one lesson a week	19 50
Violin or other stringed instrument, two lessons a week, each semester	26 50
Same, one lesson a week	14 50
These students may enter classes in Physical Training (see p. 236) on paying, each semester	5 00

Students regularly enrolled and paying the "incidental" fee in other departments pay music fees as follows:

Piano, organ, or voice, two lessons a week, each semester	$ 25 00
Same, one lesson a week	15 00
Violin or other stringed instrument, two lessons a week	19 00
Same, one lesson a week	10 50

All students in harmony, counterpoint, fugue, etc., in classes not to exceed four, pay each semester	9 00

No deduction is made on account of absence in any course, except in case of protracted illness.

Students can rent pianos for practice by applying to the head of the music department.

Law School

Students of the Law School, upon satisfying the requirements for admission, pay the matriculation fee of	$ 10 00
Tuition fee, each semester	25 00
Students conditioned on entrance requirements pay, each semester, an additional fee of	5 00

School of Medicine

Matriculation fee, paid each year	$ 5 00
General ticket, each year	105 00
Winter Term—	
Laboratory Deposit (for material and breakages, balance returned)	25 00
Matriculation fee, good for the year	5 00
Spring Term—	
General ticket	20 00
Laboratory deposit	10 00

School of Pharmacy

Tuition fee, each year	$75 00
Laboratory deposit, each year	5 00

Preparatory School

All pupils in the Preparatory School pay, each semester, an "incidental" fee of	$12 00
Also a tuition fee of	7 50

ALL BILLS due the University *must be paid within ten days after the student enters classes.*

NECESSARY EXPENSES

The following are, for students attending at Urbana, estimated average annual expenses, exclusive of books, clothing, railroad fare, laboratory fees, if any, and small miscellaneous needs:

*Term fees	$24 00	to	$24 00
Room rent for each student (two in room)	23 00	"	50 00
Table board in boarding houses and clubs	90 00	"	126 00
Fuel and light	10 00	"	15 00
Washing	12 00	"	18 00
Total	$159 00	to	$233 00
Board and room in private houses, per week	4 00	"	6 00

CAUTION TO PARENTS—STUDENTS' FUNDS

The Business Manager will receive on deposit any funds

*Students of law and music, and pupils of the Preparatory School, must make needed changes in the amount given for "Term fees."

parents may entrust to him to meet the expenses of their sons and daughters. No greater error can be committed than to send young people from home with large amounts of spending money, and without the authoritative care of some prudent friend. Half the dissipation in colleges springs from excessive allowances of money.

PREPARATORY SCHOOL

INSTRUCTORS

EDWARD G. HOWE, B. S., Principal, Natural Science.
LILLIE ADELLE CLENDENIN, English.
REUBEN S DOUGLASS, A. B., Geometry and Physics.
CHARLES B. RANDOLPH, A. B., Latin and Greek.
CLARENCE W. ALVORD, A. B., History and Algebra.

This school offers special advantages to young men and women who, on account of advanced age or prolonged absence from school, are out of touch with the high school.

ADMISSION

Candidates for admission must be at least fifteen years of age. Those of age may enter such classes as they are prepared for without examination. All under twenty-one years of age, except those coming from accredited schools (see p. 37), must pass a satisfactory examination in the following subjects:

1. ARITHMETIC.—A thorough knowledge is required of fundamental operations, simple and denominate numbers, the metric system of weights and measures, common and decimal fractions, practical measurements, percentage, ratio and proportion.

2. ENGLISH.—The examination is intended to test the student's vocabulary, and his knowledge of grammar.

3. GEOGRAPHY.—An accurate knowledge of physical configuration, political divisions, and important centers of population, is required.

4. HISTORY.—As a foundation in this subject, a knowledge of the early settlement of North America, and of the growth and

development of the United States, is required. A knowledge of the nature and operation of the forces active in American life is desired, rather than the memorization of isolated dates and names.

ENTRANCE should be made at the opening of a semester. Examinations are held in the rooms of the school. For the first semester, 1899-1900, these examinations occur on Thursday, Friday, Saturday, and Monday, the 14th, 15th, 16th, and 18th of September; for the second semester Friday and Saturday, February 2 and 3, 1900. Examinations on these dates are free, but for examinations at other times a fee of three dollars is charged.

EXAMINATIONS may be conducted in Illinois by county superintendents of schools in the same manner as for teachers' certificates, and their favorable reports will be accepted for entrance. First or second grade teachers' certificates from superintendents of Illinois will be taken for the same purpose.

ADMISSION FROM ACCREDITED SCHOOLS. On the written recommendation of their principals, students from the accredited schools of the University may be admitted without entrance examinations and credit will be allowed for all equivalent work already done. Blanks for such recommendations will be sent on application.

COURSE OF STUDY

The time necessary for the completion of the course is not fixed, but depends on the ability and previous training of the student. Applicants will be admitted at any time on presenting proof that they are prepared to pursue the selected subjects. Preparatory students generally carry four studies, one of which should be such as needs but little work outside of the class room. The number varies, however, with the ability of the student and the nature of the course.

The following schedule gives the subjects in which instruction can be had and the term or terms in which they are taught:

SCHEDULE OF STUDIES

SUBJECT	FIRST SEMESTER	SECOND SEMESTER
Algebra*	To Involution.	Through quadratics.
Botany		Second semester.
Composition and Rhetoric.	Advanced grammar. Composition and reading through the year.	Rhetoric.
English Literature.	Literature. Themes and reading through the year.	
Drawing	Either semester.	
French	Three semesters.	Begin in second.
German	Three semesters.	Begin in second.
Latin, first year	Beginners' book.	Reader and Cæsar.
Latin, second year	Cæsar and Sallust.	Cicero.
Latin, third year	Cicero and Vergil.	
Greek, first year	Grammar, readings, composition and Anabasis.	
Greek, second year	Anabasis, Hellenica, Herodotus, composition and grammar.	
Geometry	Plane and solid, both begin each semester.	
History	English and American, through one year.	
Physics	After holiday recess.	
Physiology	To holiday recess.	
Zoölogy	First semester.	

Students, in choosing studies from the above list, must take them in the required sequence.

COURSES OF INSTRUCTION

ALGEBRA

Rapidity and accuracy in all operations is rigidly required. Special emphasis is laid upon the use of purely literal expressions, radicals, fractional and negative exponents, and upon the fundamental nature of the equation.

* If five or more apply, a class will *review* the entire subject in the first semester.

BOTANY

This is a study of plants rather than of books about plants, although books are not disregarded. It is an introduction to the science, and is intended to give an acquaintance with the chief features of the subject. The analysis of simple flowers and the preparation of a small herbarium of correctly named and properly mounted plants is required. *Bergen's Elements of Botany.*

ENGLISH

The subject is presented in such a way as to increase the student's vocabulary and to develop elegance and exactness of expression in his composition. Advanced grammar and rhetoric are taught in connection with this work. The study of literary masterpieces is also pursued to furnish material for the weekly written exercises, and to cultivate a taste for good literature. Considerable collateral reading in English and American authors is therefore required.

FREE-HAND DRAWING

This subject is best taken in the first semester in order that pupils may have the benefit of its training in the studies which follow. *Frederick's Notes on Free-Hand Drawing.*

FRENCH

The work in this subject will be the same as that indicated under entrance requirements, p. 47.

GERMAN

COURSE A.—Beginning work, Joynes-Meissner's Grammar and a German reader. Second semester at 1:20.

COURSE B.—Advanced course. Joynes-Meissner's Grammar, Harris's Prose Composition and translation of narrative prose. First and second semesters at 11.

Required: German A or one year of high school work.

GEOMETRY

Special attention is paid to the development of the idea of mathematical demonstration; and, as many students who can reason logically cannot express their ideas clearly, due attention is paid to correctness of form. As soon as the student has attained the art of rigorous demonstration he is required to produce constructions and demonstrations for himself. Considerable attention is devoted to original work. *Wentworth's Plane and Solid Geometry.*

GREEK

The study of this subject should, when possible, be preceded by at least one year of Latin. For particulars see entrance requirements, p. 48.

HISTORY

Instruction in this subject is confined to English and American history. A detailed study of the rise and progress of the English-speaking people in England and America is made, and considerable attention is given to the origin and development of representative government. *Green's Shorter History of the English People; Fiske's History of the United States, and Civil Government.*

LATIN

The ground covered consists of the grammar and selections from Cæsar, Sallust, Cicero, and Vergil. Translation of English into Latin is made a prominent part of the work, and in connection with the Vergil the scansion of hexameter verse and matters of historical and mythological interest are studied. The Roman method of pronunciation is used, with special attention to quantity.

PHYSICS

This study is so presented as to cultivate habits of careful observation, and to develop in the student the ability to reach general conclusions inductively by means of exact experiment. In all laboratory work the student is required to keep a note-book containing a complete record of experiments performed.

PHYSICAL TRAINING

Preparatory students may have the benefit of a thorough physical examination and regular exercise, under the guidance of University instructors, but not for either entrance or University credits.

PHYSIOLOGY

In this subject the book used is illustrated by the use of charts, skeleton, and manikin, and by a series of laboratory experiments. *Colton's Physiology.*

ZOÖLOGY

Through the study of typical animals the subject is so presented as to lead the student to a knowledge of methods of scientific classification in the natural sciences, and to prepare for the more advanced work of the University. Kingsley's Comparative Zoölogy and collateral reading.

REGULATIONS

Reports regarding all non-resident and minor students (and, upon request, regarding any others) are sent to parents or guardians as soon as students are settled in their work, and reports regarding all students are sent at the close of each term.

The calendar of the Preparatory School is the same as that of the University.

For information concerning fees and expenses, see page 267.

For special information with regard to the Preparatory School, address Edward G. Howe, Urbana, Illinois.

LIST OF STUDENTS

TECHNOLOGICAL, SCIENTIFIC, AGRICULTURAL, AND LITERARY DEPARTMENTS

GRADUATE SCHOOL

Alvord, Clarence Walworth, A.B., *(Williams College)*, 1891, *Champaign*, History and Philosophy.

*Barclay, Thomas, B.S., 1891, *Aurora*, Smelting and Refining Processes of the United States; Geology of Ore Deposits.

Beasley, D. Edythe, A.B., 1898, *Urbana*, Classical.

Black, William Wesley, A.B., 1898, *Champaign*, Pedagogy.

Boggs, Cassandra Armstrong, B.L., 1892, *Urbana*, English and Pedagogy.

Braucher, Ralph Waldo, B.S., 1897, *Lincoln*, Zoölogy and Horticulture.

Brenke, William Charles, B.S., 1896, *Urbana*, Astronomy and Mathematics.

*Burt, Henry Jackson, B.S., 1896, *Wall Lake, Ia.*, Civil Engineering.

Carpenter, Hubert Vinton, B.S., 1897, *Champaign*, Mathematics and Physics.

Carson, Lucy Hamilton, Ph.B., *(Univ. of Chicago)*, 1898, *Bluff Springs*, English.

Coffeen, Harry Clay, B.S., 1898, *Champaign*, Astronomy and Mathematics.

Connet, Ella, M.L., 1894, *Champaign*, Pedagogy.

Craig, Wallace, B.S., 1898, *Havana*, Zoölogy.

Dewey, Louise Sarah, B.S., 1897, *Urbana*, Physiology.

Dillon, William Wagner, A.B., 1898, *Sheldon*, History and Economics.

*Eckles, Harry Edward, B.S., 1898, *Chicago*, Civil Engineering.

*Fischer, Louis Englemann, B.S., 1898, *Paris*, Municipal and Sanitary Engineering.

Fraser, Wilber John, B.S., 1893, *Champaign*, Agriculture.

*Gardner, Frank Duane, B.S., 1891, *Washington, D. C.*, Agriculture.

Grimes, George Lyman, B.S., 1897, *Ann Arbor, Mich.*, Mechanical Engineering.

* *In absentia*, see p. 250.

*Hallinen, Joseph Edward, B.S., 1894, *Ottawa,* Zoölogy and Pedagogy.

Heller, Opal, B.L., 1891, *Urbana,* English and Pedagogy.

*Honens, Fred William, B.S., 1896, *Sterling,* Civil Engineering.

Hubbard, George David, M.S., 1898, *Urbana,* Paleontology, Zoölogy, and Entomology.

*Ketchum, Milo Smith, B.S., 1895, *Houghton, Mich.,* Civil Engineering.

*Ketchum, Richard Bird, B.S., 1896, *Chicago,* Civil Engineering.

*Kimball, William Haven, B.S., 1895, *San Francisco,* Electrical Engineering.

Kofoid, Mrs. Prudence Winter, A.B., *(Oberlin College),* 1890, *Urbana,* History.

*Lampe, Margaret Henrietta Johanne, A.B., 1897, *Bloomington,* German.

*Linn, Homer Roberts, B.S., 1896, *Cleveland, Ohio,* Mechanical Engineering.

McCormack, Harry, B.S., *(Drake Univ.),* 1896, *Koshkonong, Mo.,* Chemistry.

Marble, Harry Curtiss, B.S., 1896, *Champaign,* Electrical Engineering.

*Martin, James Madison, A.B., 1896, *Pana,* Pedagogy, Sociology, and Psychology.

*Millar, Adam Vause, B.S., 1897, *Champaign,* Mathematics and Astronomy.

Neureuther, Andrew Henry, B.S., 1898, *Peru,* Mechanical Engineering.

*Nevins, John, B.S., 1898, *Camp Point,* Architecture.

*Newell, Mason Harder, *Springfield,* Public Law and Administration.

*Parr, John Louis, B.S., 1897, *Peoria,* Architecture.

Quaintance, Hadly Winfield, A.B., *(Univ. of Neb.),* 1896, *Cable,* Economics and History.

Randolph, Charles Brewster, A.B., *(Wabash College),* 1896, *Urbana,* Spanish.

*Richart, Frederick William, B.S., 1891, *Collinsville,* Mechanical Engineering.

Rose, Carlton Raymond, Ph.M., *(Univ. of Mich.),* 1896, *Champaign,* Chemistry.

Sammis, John Langley, B.S., 1897, *Champaign,* Chemistry.

*Sayers, Albert Jefferson, B.S., 1895, *Chicago,* Mechanical Engineering.

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* *In absentia,* see p. 250.

Shamel, Archibald Dixon, B.S., 1898, *Taylorville,* Agriculture.
Smith, Louie Henrie, B.S., *Crystal Lake,* Chemistry.
*Sweney, Don, B.S., 1896, *Champaign,* Mechanical Engineering.
Sy, Albert Philip, B.S., 1894, *Altamont,* Chemistry.
*Teeple, Wallace Douglas, B.S., 1897, *Marengo,* Architecture.
*Tower, Willis Eugene, B.S., 1894, *Chana,* Physics.
*Unzicker, William Luther, A.B., 1898, *Hopedale,* Latin.
Waits, Charles Jefferson, A.B., *(Indiana Univ.),* 1894, *Carlisle, Ind.,* Pedagogy.
*Wallace, Herbert Milford, A.B., 1897, *Seattle, Wash.,* Economics.
Walter, Charles Albert, B.S., Ph.C., 1898, *Indianapolis, Ind.,* The Quantitative Estimation of the Active Medicinal Principles of Plants.
Ward, Mrs. Velma Skinner, B.L., 1877, *Champaign,* English.
*Webber, Hubert Anthony, B.S., 1897, *Kankakee,* Architecture.
*Williamson, Albert St. John, B.S., 1898, *Quincy,* Mechanical Engineering.
Worthen, George Bedell, LL.B., 1898, *St. Louis,* Law.

SENIORS

[In the lists which follow, "L. and A.' stands for College of Literature and Arts; "S." for College of Science.]

Anderson, Harry,	*Sheldon,*	Electrical Eng'g.
Armstrong, Frank Hall,	*Serena,*	Mechanical Eng'g.
Bayard, Samuel Michael,	*Vincennes, Ind.*	General, L. and A.
Beckerleg, Gwavas Foster,	*Chicago,*	Civil Engineering.
Bennett, Ralph,	*Chicago,*	Electrical Eng'g.
Bennett, Ruth,	*Chicago,*	General, L. and A.
Bigelow, Mary Constance,	*Champaign,*	Math., L. and A.
Bocock, Clarence Edgar,	*Bradford,*	General, L. and A.
Booker, Lucile Alice,	*Champaign,*	General, L. and A.
Bradley, James Clifford,	*Morrison,*	Mechanical Eng'g.
Branch, Elizabeth,	*Champaign,*	Library.
Burkland, Theodore Leonard,	*Moline,*	Civil Engineering.
Burroughs, Elmer,	*Savoy,*	Electrical Eng'g.
Busey, Robert Oscar,	*Urbana,*	General, L. and A.
Chipps, Halbert Lilly,	*Sullivan,*	Civil Engineering.
Chuse, Harry Arthur,	*Mattoon,*	Mechanical Eng'g.
Clark, Edith,	*Vandalia,*	General, L. and A.

* *In absentia,* see p. 250.

Clark, Mary Edith,	*Champaign,*	Classical.
Clark, Philip Henry,	*Galena,*	General, L. and A.
Clifford, Charles Luther,	*Serena,*	Electrical Eng'g.
Cooke, Jane Elizabeth,	*Monroe, Mich.,*	Library.
Detrick, Nellie Elizabeth,	*Champaign,*	General, L. and A.
Dill, William,	*Little Rock, Ark.,*	Architecture.
Dinwiddie, Virginia,	*Champaign,*	Natural Science.
Dodds, George,	*Neoga,*	Electrical Eng'g.
DuBois, Alexander Dawes,	*Springfield,*	Electrical Eng'g.
Eastman, Harry Truxtun,	*Rock Island,*	Architecture.
Ely, Howard Montgomery,	*Peoria,*	Mechanical Eng'g.
Fairchild, Edna,	*Toledo, Ohio,*	Library.
Fleager, Clarence Earl,	*Sheldon,*	Electrical Eng'g.
Flesch, Eugene William Penn,	*Chicago,*	Architecture.
Foberg, John Albert,	*Chicago,*	Math. and Physics.
Fowler, Robert Lambert,	*Salt Lake City, Utah,*	Civil Eng'g.
Fraser, William Alexander,	*La Salle,*	Mechanical Eng'g.
Garver, Daisy,	*Bloomington,*	Classical.
Gerber, Winifred Dean,	*Rockford,*	Municipal Eng'g.
Gilchrist, Hugh McWhurr,	*Gilchrist,*	Electrical Eng'g.
Graham, George Woods,	*Freeport,*	Civil Engineering.
Griffin, Walter B,	*Elmhurst,*	Architecture.
Grim, Fred,	*Canton,*	Civil Engineering.
Hall, Louis Dixon,	*Hawarden, Iowa,*	Agriculture.
Haseltine, Warren Edmund,	*Aurora,*	Chemistry.
Herwig, John Newton,	*Mason City,*	Mechanical Eng'g.
Hill, Irwyn Horatio,	*Joliet,*	Architecture.
Hoagland, John King,	*Herborn,*	Agriculture.
Hubbard, George Wallace,	*Urbana,*	Mechanical Eng'g.
Hughston, Allie Dellèna,	*Urbana,*	Natural Science.
Husk, Frederick William,	*Shabbona,*	Electrical Eng'g.
James, Frederick Milton,	*Piasa,*	Natural Science.
Jones, Louise,	Champaign,	General, L. and A.
Jutton, Emma Reed,	*Champaign,*	Library.
Kable, James Franklin,	*Virden,*	Architectural Eng'g.
Ketchum, Daniel Clement,	*Champaign,*	Political Science.
Koch, Fritz Conrad,	*Elmhurst,*	Chemistry.
Landel, Ida Susan,	*Champaign,*	General, L. and A.
Latzer, John Albert,	*Highland,*	Agriculture.
Lawrence, Carroll Gray,	*Carbondale,*	Architecture.
Leach, William Blake,	*McLean,*	Eng. and Mod. Lang.

Leutwiler, Oscar Adolph,	*Highland,*	Mechanical Eng'g.
Loftus, Ella,	*Champaign,*	General, L. and A.
McElfresh, Fred Morgan,	*Jacksonville,*	Natural Science.
McGilvrey, Mrs. Mary,	*Urbana,*	General, L. and A.
Meharry, Jesse Erle,	*Tolono,*	Political Science.
Mercil, Benoni Edward,	*Chicago,*	Electrical Eng'g.
Mesiroff, Josef,	*Chicago,*	Electrical Eng'g.
Montross, Sarah Elizabeth,	*Chicago,*	Library.
Newell, Mason Harder,	*Springfield,*	General, L. and A.
Nilsson, Olaf Anton,	*Urbana,*	Architectural Eng'g.
Null, Marion Michael,	*Blandinsville,*	Natural Science.
Olson, Joseph Matthias,	*Ottawa,*	General, L. and A.
Owens, Dasie Margaret,	*Urbana,*	Natural Sciencc.
Paine, Arthur Elijah,	*Rosemond,*	General, L. and A.
Parham, Nellie E,	*Lima, Ind.,*	Library.
Paul, Wesley Arthur,	*Peoria,*	Natural Science.
Porter, Horace Chamberlain, A.B., 1897.	*Champaign,*	Chemistry.
Postel, Fred Jacob,	*Mascoutah,*	Electrical Eng'g.
Putnam, Alice,	*Chicago,*	Music.
Railsback, Roy J,	*Hopedale,*	General, L. and A.
Rapp, George Leslie,	*Carbondale,*	Architecture.
Raymond, Ruth Cleveland,	*Sidney,*	General, L. and A.
Reat, Fred Lee,	*Tuscola,*	General, L. and A.
Rhoads, Emma May,	*Champaign.*	Eng. and Mod. Lang.
Rhoads, Horace Adams,	*Champaign,*	General, L. and A.
Ritchey, Felix,	*Cadwell,*	General, L. and A.
Rudnick, Paul Frederick Augustus,	*Chicago,*	Chemistry.
Rugg, Elma Almira, A.B. *(Portland Univ.),* 1898,	*Urbana,*	General, L. and A.
Schutt, Walter Robert,	*Belleville,*	Ger. and Romanic Lang.
Seely, Garrett Teller,	*Oswego,*	Civil Engineering.
Shawhan, Gertrude, B.L., 1894,	*Champaign,*	Library.
Sheean, Frank Thomas,	*Galena,*	General, L. and A.
Sheean, Henry David,	*Galena,*	General, L. and A.
Sheldon, Carl Edmunds,	*Sterling,*	General, L. and A.
Smith, Charles Augustus,	*Mattoon,*	Architecture.
Smith, Elmer Church,	*Columbus, Neb.,*	Civil Eng'g.
Smith, Florence Mary,	*Urbana,*	Classical.
Smoot, Elma,	*Danville,*	General, L. and A.
Smurr, Thomas Woods,	*Ottawa,*	General, L. and A.

Sparks, Marion Emeline, A.B., 1895.	*Urbana,*	Library.
Staley, Maggie Edith,	*Urbana,*	General, L. and A.
Streight, Laura Allana,	*Franklinville, N. Y.,*	Library.
Swenson, Sidney Orin,	*Chicago,*	Electrical Eng'g.
Tarrant, William Henry,	*Champaign,*	Civil Engineering.
Tebbetts, George Edward,	*Chicago,*	Civil Engineering
Theiss, Otto John,	*Sublette,*	Civil Engineering.
Thompson, Ralph,	*Carbondale,*	General, L. and A.
Ullensvang, Martin L,	*Steward,*	Natural Science.
Vance, William Herbert,	*Edwardsville,*	Civil Engineering.
Vial, Alice Mildred,	*Western Springs,*	General, L. and A.
Volk, Edmund,	*Mendota,*	Electrical Eng'g.
Waters, Willard Otis, A.B. *(Benzonia Coll.)*, 1896,	*Benzonia, Mich.,*	Library.
Weaver, Ben: Perley,	*Urbana,*	Natural Science.
Webster, William W,	*Urbana,*	Mechanical Eng'g.
Weirick, Ralph Wilson,	*Washington,*	Architecture.
Wernham, James Ingersoll,	*Marengo,*	Natural Science.
Whitmeyer, Mark Hubert,	*Danville,*	Architecture.
Willcox, Maurice Meacham,	*Elmore,*	Civil Engineering.
Wilmarth, George Henry,	*Aurora,*	Electrical Eng'g.
Woolsey, Lulu Catherine,	*Polo,*	Political Science.
Young, Bertram Otho,	*LeRoy,*	Natural Science.

JUNIORS

Alarcó, Joseph Maria,	*Valencia, Spain,*	Electrical Eng'g.
Ambler, Sarah, M.S. *(Iowa Wesleyan)*, 1885,	*Mt. Pleasant, Iowa,*	Library.
Appelquist, Jerome Gustav,	*Orion,*	Civil Engineering.
Ashley, Harriet Elizabeth,	*Urbana,*	General, L. and A.
Beach, Wilfred Warren,	*Sioux City, Iowa,*	Architecture.
Bear, Katharine W,	*Ludlow,*	Natural Science.
Beck, Florence Maria,	*Platteville, Wis.,*	Library
Bennett, Edith Page,	*Mattoon,*	Classical
Bevans, Thomas Murray,	*Chicago,*	Electrical Eng'g.
Bixby, Alice Persis,	*Champaign,*	Library.
Bracken, Ellis Freeman,	*Greenview,*	Electrical Eng'g.
von Briesen, Julia Henrietta,	*Columbus, Wis.,*	Library.
Brown, William Jay,	*Urbana,*	Architecture.
Bryant, Ralph Clement,	*Princeton,*	Natural Science.

Burke, Eugene,	*Champaign,*	Philosophy, S.
Bush, John Kenyon,	*Joliet,*	General, L. and A.
Caldwell, Charlotte Jane, A.B. *(Ohio Female Coll)*, 1856,	*Cincinnati, Ohio,*	Library.
Calhoun, Henrietta Anne,	*Champaign,*	Natural Science.
Campbell, Bruce Alexander,	*Albion,*	General, L. and A.
Capron, Clyde,	*Marion,*	Political Science.
Carey, Miriam Eliza,	*Freeport,*	Library.
Church, Walter Samuel,	*Chicago,*	Architecture.
Clatworthy, Linda Marie,	*Evanston,*	Library.
Darmer, George Alexander,	*Champaign,*	General, L. and A.
Dobbins, Lester Charles,	*Champaign,*	Political Science.
Dowiatt, Stanislav,	*Chicago,*	Mechanical Eng'g.
East, Edward Murray,	*DuQuoin,*	Chemistry.
Eddy, Clarence LeRoy,	*Weldon, Iowa,*	Civil Engineering.
Few, Walter Henderson,	*Delavan,*	Electrical Eng'g.
Fisher, John William,	*Orangeville,*	Natural Science.
Foster, William Grant,	*Urbana,*	Architecture.
Fox, Harry Bert,	*Urbana,*	Natural Science.
Francis, Frank D,	*New Lenox,*	General, L. and A.
Freeman, Harry Eben,	*Millington,*	Natural Science.
Gernand, William Isaac,	*Rossville,*	Electrical Eng'g.
Goodman, Ella,	*Chicago,*	Library.
Graham, Hugh Joseph,	*Springfield,*	General, L. and A.
Gray, Robert,	*Lily Lake,*	Electrical Eng'g.
Gunthorp, Pauline, B.L. *(Univ. of Wis.)*, 1898,	*Austin,*	Library.
Hanson, Rachelle Margaret,	*Urbana,*	Natural Science.
Harker, George Mifflin,	*Carbondale,*	General, L. and A.
Harker, Oliver Albert, Jr.,	*Carbondale,*	General, L. and A.
Harrower, John Charles,	*Barrington,*	Mechanical Eng'g.
Hartrick, Dinchen Clara,	*Urbana,*	General, L. and A.
Hartrick, Louis Eugene,	*Urbana,*	Natural Science.
Hartrick, Nancy Emma,	*Urbana,*	General, L. and A.
Harts, David Hassleton, Jr.,	*Lincoln,*	General, L. and A.
Hasson, Harry,	*Lewistown,*	Chemistry.
Haven, Georgetta,	*Cincinnati, Ohio,*	Library.
Hawley, William Albert,	*Dundee,*	Civil Engineering.
Hines, Edward George,	*Huey,*	Architecture.
Holabird, Robert Grant,	*Evanston,*	Architectural Eng'g.
Jackman, Ida Louise,	*Elgin,*	Library.

Jahr, Torstein, A.B. *(Norwegian Luth. Coll.)*, 1896,	*Chicago,*	Library.
Johnson, Charles Sunderland,	*Champaign,*	Mechanical Eng'g.
Johnston, Arthur Russell,	*Joliet,*	Chemistry.
Jones, Albert Edward,	*Lena,*	General, L. and A.
Jordan, George Thomas,	*Tolono,*	General, L. and A.
Keeney, Harry Ezra,	*Sterling,*	Mechanical Eng'g.
Kepler, George Frank,	*Ashtabula, Ohio,*	Architecture.
Kingsbury, James Thompson,	*Pinkstaff,*	General, L. and A.
Kirkpatrick, Asa Baird,	*Elmwood,*	Natural Science.
Kratz, James Piatt,	*Monticello,*	General, L. and A.
Kreikenbaum, Charles Otto Adolph,	*Chicago,*	Chemistry.
Kuehn, Alfred,	*Chicago,*	Civil Engineering.
Lathrop, Olive Clarice,	*Hastings, Mich.,*	Library.
Latzer, Jennie Mary,	*Highland,*	Natural Science.
Lee, Julian Liechaski,	*Memphis, Tenn.,*	Mech. Eng'g.
Logue, Charles Louis,	*Danville,*	Chemistry.
McMurry, Fred Russell,	*Normal,*	General, L. and A.
McWilliams, Nellie Louise,	*Champaign,*	General, L. and A.
Martin, Robert William,	*Wilmington,*	Political Science.
Mather, Lydia Maria,	*Joliet,*	Latin.
Maury, Harvey,	*Rossville,*	Civil Engineering.
Mayall, Edwin Lyman,	*Peoria,*	Mechanical Eng'g.
Merrill, Stillwell Frederick,	*Collinsville,*	Chemistry.
Mills, Ralph Walter,	*Webster Groves, Mo.,*	Nat. Science.
Miner, Timothy Ralph,	*Adair,*	Agriculture.
Norton, Wilbur Perry,	*Alton,*	Electrical Eng'g.
Otwell, Allen Meade,	*Plainview,*	Natural Science.
Owens, Wilkens Hoover,	*Baltimore, Md.,*	Natural Science.
Palmer, William Gay,	*Princeton,*	General, L. and A.
Pettinger, Robert Gerald,	*Cumberland, Ia.,*	Electrical Eng'g.
Phelps, Clara B,	*Pontiac, Mich.,*	Library.
Phillips, Theodore Clifford,	*Mt. Carroll,*	Municipal Eng'g.
Ponzer, Ernest William,	*Henry,*	Math. and Physics.
Posey, Chessley Justin,	*Normal,*	Natural Science.
Price, Anna May,	*Fairbury, Neb.,*	Library.
Price, Helen Louise,	*Champaign,*	Library.
Quisenberry, Arthur Clifford,	*Lincoln,*	General, L. and A.
Radley, Guy Richardson,	*Sandwich,*	Electrical Eng'g.
Raymond, John Eaton,	*Sidney,*	Agriculture.
Reardon, Neal Daniel,	*Boynton,*	Political Science.

Reimers, Fred William,	*Evanston,*	Electrical Eng'g.
Ricker, Raymond Craver,	*Harvey,*	Architecture.
Robbins, Ernest Thompson,	*Payson,*	Agriculture.
Robertson, Lloyd Silas,	*Barrington,*	Agriculture.
Rochow, Carl John Frederick,	*Rock Island,*	Natural Science.
Rolfe, Martha Deette,	*Champaign,*	Natural Science.
Safford, Edward Brigham,	*Sycamore,*	Chemistry.
Sanford, Delia Clara,	*Platteville, Wis.,*	Library.
Sawyer, Ida Estelle, Ph.B. *(Northwestern Univ.),* 1896,	*Evanston,*	Library.
Schneider, Edward John,	*Pontiac,*	Municipal Eng'g.
Sears, Minnie Earl, M.S. *(Purdue),* 1894,	*La Fayette, Ind.,*	Library.
Seely, Blanche, B.L. *(Univ. of Minn.),* 1896,	*Minneapolis, Minn.,*	Library.
Shrum, Mabel Claire,	*La Junta, Col.,*	Library.
Simpson, Frances, M.L. *(Northwestern Univ.),* 1898,	*Evanston,*	Library.
Slocum, Roy Harley,	*Loda,*	Civil Engineering.
Smith, George Russell,	*Urbana,*	Mechanical Eng'g.
Smith, William Walter,	*Broadlands,*	Ger. and Romanic Lang.
Soverhill, Harvey Allen,	*Tiskilwa,*	Mechanical Eng'g.
Stakemiller, Benjamin Benton,	*Sterling,*	Civil Engineering.
Strohm, Adam Julius,	*Urbana,*	Library.
Strout, Frank Asbury,	*Joliet,*	Mechanical Eng'g.
Taft, Frank Harvey,	*Champaign,*	Mechanical Eng'g.
Temple, Harry Roberts,	*Elida,*	Architecture.
Thompson, George Henry,	*Champaign,*	Political Science.
Thorpe, John Charles,	*Urbana,*	Mechanical Eng'g.
Turner, Dollie Irene,	*Long View,*	General, L. and A.
Tyler, Walter Simeon,	*Joliet,*	Electrical Eng'g.
VanPatten, Seth Fields,	*Clarion, Iowa,*	General, L. and A.
Waldo, Marie L,	*Champaign,*	Natural Science.
Walker, Herbert William,	*Dundee,*	Electrical Eng'g.
Wandell, Caroline,	*Phoenix, N. Y.,*	Library.
Wehrstedt, Otto Charles,	*Evanston,*	Civil Engineering.
West, Maybelle Gay, B.L. *(Knox Coll.),* 1894,	*Galesburg,*	Library.
Wiley, Raymond Sly,	*Belleflower,*	Architecture.
Willcox, Lucy Bertha Ely,	*Chicago,*	Library.
Williams, George Bassett,	*Washington, D. C.,*	Arch. Eng'g.

Wood, Harvey Edgerton,	*Joliet,*	Chemistry.
Woods, William Francis,	*Ludlow,*	General, L. and A.
Wray, Thomas,	*Chicago,*	Electrical Eng'g.

SOPHOMORES

Allen, Albert Miller,	*Oberlin, Ohio,*	Architecture.
Allen, Frank Gilbert,	*Rock Island,*	Electrical Eng'g.
Allen, John L,	*Roodhouse,*	Electrical Eng'g.
Applegate, Alpheus Miller,	*Atlanta,*	Music.
Armitage, James Howard,	*Buckingham,*	Classical.
Arps, George Frederick,	*Carey,*	Natural Science.
Atwood, John Roy,	*Roscoe,*	Agriculture.
Bailey, Donald Herbert,	*Clinton,*	General, L. and A.
Baker, Horatio Weber,	*Champaign,*	Civil Engineering.
Baldwin, Aneta,	*Paris,*	General, L. and A.
Bardwell, Faith Leland,	*Champaign,*	General, L. and A.
Barry, George Richard,	*Hillsboro,*	Civil Engineering.
Bates, John Schuyler,	*Monmouth,*	Civil Engineering.
Bayard, Maurice Francis,	*Vincennes, Ind.,*	Architecture.
Bell, Edgar Deforest,	*Urbana,*	Mechanical Eng'g.
Black, Alice Mary,	*Champaign,*	General, L. and A.
Black, Laura Louise,	*Urbana,*	General, L. and A.
Bowles, Ida Huston,	*Paris,*	General, L. and A.
Braden, Behring Erle,	*Decatur,*	Natural Science.
Brayton, Louis Frederick,	*Mt. Morris,*	Architectural Eng'g.
Briggs, Claude Porter,	*Minier,*	General, L. and A.
Buchanan, James William,	*Charleston, Ind.,*	Natural Science.
Buell, Fred Allen,	*Ridge Farm,*	Electrical Eng'g.
Burdick, Jay Horace,	*Elgin,*	Agriculture.
Caldwell, Charles Burr,	*Monticello,*	Natural Science.
Campbell, Ashton Ellsworth,	*Champaign,*	Eng. and Mod. Lang.
Chamberlin, Charles Cory,	*Hoopston,*	General, L. and A.
Carr, George Russell,	*Oak Park,*	Chemistry.
Chapin, Edward Pierce,	*Champaign,*	General, L. and A.
Chapman, Charles Hiram,	*Vienna,*	General, L. and A.
Chester, Margaret,	*Champaign,*	General, L. and A.
Chipps, Willis Cullen,	*Sullivan,*	Mechanical Eng'g.
Clokey, Ira Waddell,	*Decatur,*	Agriculture.
Collins, Guy Richard,	*Urbana,*	Mechanical Eng'g.
Cone, George Carroll,	*Farmington,*	Architecture.
Cook, Clara,	*Champaign,*	General, L. and A.

Crossland, George Marshall,	*Sheldon,*	General, L. and A.
Curfman, Lawrence Everett,	*Urbana,*	Math. and Physics.
Davidson, Bessie Marie,	*Wooster, Ohio,*	Library.
Davis, Mary Belle,	*Urbana,*	General, L. and A.
Drew, Fred Leon,	*Elgin,*	Mechanical Eng'g.
Dunning, William Neil,	*Chicago,*	Civil Engineering.
Emmett, Arthur Donaldson,	*Peoria,*	Chemistry
Fairclo, George Cassius,	*Champaign,*	Civil Engineering.
Fishback, Mason McCloud,	*Champaign,*	General, L. and A.
Fisher, James Mellville,	*Neoga,*	General, L. and A.
Franks, Charles Wilber,	*Brookville,*	General, L. and A.
Frazey, Nellie May,	*Urbana,*	General, L. and A.
Freese, John Andrew,	*Cadwell,*	Natural Science.
Frost, Frank G,	*Gays,*	Mechanical Eng'g.
Fucik, Edward James,	*Chicago,*	Electrical Eng'g
Gardiner, Charles Matthew,	*Champaign,*	Chemistry.
Garnett, Grace Ann,	*St. Marys,*	General, L. and A.
Garrett, Richard Pratt,	*Delavan,*	Political Science.
Gayman, Myrtle,	*Champaign,*	General, L. and A.
Gibbs, George, Jr.,	*Champaign,*	Natural Science.
Gillett, Walter Noble,	*Chicago,*	Electrical Eng'g.
Gilmore, Thomas,	*Macomb,*	Electrical Eng'g.
Ginzel, Roland Francis,	*Trenton,*	Architecture.
Gleason, Henry Allen,	*Champaign,*	Natural Science.
Goodwin, John Mitchell,	*Hot Springs, Ark.,*	Political Science.
Gordon, Joseph Hinckley,	*Vandalia,*	Classical.
Graber, Howard Tyler,	*Peoria,*	Chemistry.
Green, Frances Myrtle,	*Urbana,*	General, L. and A.
Greene, Charles Thomas,	*Chicago,*	Classical.
Gridley, Harry Norman,	*Virginia,*	General, L. and A.
Griswold, Augustus Harold,	*Princeton,*	Electrical Eng'g.
Gross, Albertina Marguerite,	*Joliet,*	Natural Science.
Gulick, Margaret Grace,	*Champaign,*	General, L. and A.
Hammers, Edna Rose,	*Champaign,*	General, L. and A.
Hannan, John Edward,	*Champaign,*	General, L. and A.
Hartrick, Guy Russell,	*Urbana,*	Chemistry.
Hayes, Zella Bernice,	*Urbana,*	General, L. and A.
Hays, Carl,	*Urbana,*	Civil Engineering.
Headen, Thomas Moulton,	*Shelbyville,*	General, L. and A.
Hensley, Marion Charles,	*Champaign,*	Chemistry.
Hicks, Byron Wallace,	*Warren,*	Electrical Eng'g.

Hinkle, Ida May,	*Champaign,*	General, L. and A.
Hinrichsen, Edward Eugene,	*Jacksonville,*	Electrical Eng'g.
Holcomb, Timothy Osmond, Jr.,	*Milmine,*	Natural Science.
Hobble, Arthur Casson,	*Rushville,*	Electrical Eng'g.
Hoppin, Charles Albert,	*Aurora,*	Mechanical Eng'g.
Horrom, William Alva,	*Atlanta,*	Civil Engineering.
Housel, Oscar Lloyd,	*Galesburg,*	Electrical Eng'g.
Howard, Clara Elizabeth,	*Bloomington,*	General, L. and A.
Hughes, Clarence Wilbert,	*Urbana,*	General, L. and A.
Hunter, Harry Edgar,	*Newton, Iowa,*	Architecture.
Hurlbert, Flora Dorothy,	*Morrison,*	Library.
Joy, Samuel Scott,	*Princeton,*	Architecture.
Kariher, Harry Cullen,	*Champaign,*	Natural Science.
Katt, Adolph John,	*Belleville,*	Mechanical Eng'g.
Keator, Edward Oris,	*Polo,*	Civil Engineering.
Kemmerer, John Martin,	*Assumption,*	Civil Engineering.
Kirkpatrick, Harlow Barton,	*Anna,*	Civil Engineering.
Kolbe, Benjamin Ralph,	*St. James, Minn.,*	Electrical Eng'g.
Laugman, John Oscar,	*Helmar,*	Natural Science.
Layton, Katherine Alberta,	*Canton,*	Classical.
Lewis, Addison Thompson,	*Chatham,*	Chemistry.
Lindley, Walter Charles,	*Neoga,*	General, L. and A.
Lodge, Paul Edmund,	*Monticello,*	General, L. and A.
Lotz, John Rudolph,	*Lockport,*	Electrical Eng'g.
Lowenthal, Fred,	*Chicago,*	General, L. and A.
Lyman, Frank Lewis,	*Farmingdale,*	Chemistry.
Lytle, Ernest Barnes,	*Decatur,*	Math. and Physics.
McAnally, Harry Forrest,	*Paris,*	Electrical Eng'g.
McCall, Eugene Adolphus,	*Vienna,*	General, L. and A.
McCormick, Roscoe,	*Garber,*	Natural Science.
McCune, Fred Leavitt,	*Sterling,*	Mechanical Eng'g.
Martin, Camden Edward,	*Lacon,*	General, L. and A.
Marsh, Albert Leroy,	*Pana,*	Chemistry.
Miles, Rutherford Thomas,	*Champaign,*	Natural Science.
Miller, William Pitt,	*Champaign,*	Math. and Physics.
Mitchell, Annie,	*Bement,*	General, L. and A.
Moon, Amy Constance,	*Champaign,*	General, L. and A.
Murphy, Merritt Norton,	*Chicago,*	Electrical Eng'g.
Myers, Jesse J,	*Green River,*	Natural Science.
Nabstedt, Frederick,	*Davenport, Ia.,*	Electrical Eng'g.
Newcomb, Cyrus Forsyth,	*Champaign,*	Natural Science.

Newton, Fred Earle,	*Onarga,*	General, L. and A.
Nichols, Bertha Vie,	*Champaign,*	General, L. and A.
Nicholson, Gunther,	*Lima, Ind.,*	General, L. and A.
Norton, Charles Waterman,	*Lockport,*	Classical.
O'Hair, Edna,	*Laurel, Ind.,*	General, L. and A.
Parkins, Charles Raymond,	*Chicago,*	Civil Engineering.
Patrick, Frederick Phillips,	*Blue Island,*	Architectural Eng'g.
Pearson, Frank Edward,	*Chicago,*	Civil Engineering.
Peeples, Cornelius James,	*Shawneetown,*	Eng. and Mod. Lang.
Pletcher, Nuba Mitchel,	*Hoopeston,*	General, L. and A.
Pollard, Earle Royal,	*Centralia,*	Mechanical Eng'g.
Praeger, William Emilius,	*Keokuk, Iowa,*	Natural Science.
Radcliffe, William Hickman,	*Springfield,*	Civil Engineering.
Ray, Walter Thornton,	*Metamora,*	Mechanical Eng'g.
Read, Nellie Lewis,	*Urbana,*	General, L. and A.
Redfield, George William,	*Galesburg,*	Electrical Eng'g.
Roberts, Harry Ashton,	*Ottawa,*	Civil Engineering.
Rogers, Lawrence Stevens,	*Mendota,*	Civil Engineering.
Rolfe, Mary Annette,	*Champaign,*	Natural Science.
Scarborough, Charles Middlesworth,	*Shelbyville,*	General, L. and A.
Schroeder, Curt August,	*Chicago,*	Chemistry.
Scott, Frank William,	*Centralia,*	General, L. and A.
*Seidel, Charles William,	*Sterling,*	Civil Engineering.
Short, Walter Campbell,	*Fillmore,*	General, L. and A.
Simmons, Aaron Trabue,	*Jerseyville,*	Architecture.
Sims, Mrs. Flora Morris,	*Urbana,*	Art and Design.
Sluss, Alfred Higgins,	*Tuscola,*	Electrical Eng'g.
Smith, George Carroll,	*Flora,*	General, L. and A.
Smith, Percy Almerin,	*Dixon,*	Natural Science.
Stevenson, Ralph Ewing,	*Bloomington,*	Mechanical Eng'g.
Stewart, Miles Vincent,	*Toulon,*	Electrical Eng'g.
Stoltey, Jennie Florence,	*Champaign,*	General, L. and A.
Storey, Ellsworth Prime,	*Chicago,*	Architectural Eng'g.
Swift, Charles Clyde,	*Streator,*	Civil Engineering.
Tallyn, Louis Liston,	*Benson,*	Civil Engineering.
Theodorson, William Auton,	*Chicago,*	Civil Engineering.
Thompson, Lenora Belle,	*Steward,*	General, L. and A.
Tompkins, Clara Alice,	*Grover,*	Agriculture.
Tull, Effie May,	*Farmer City,*	Classical.
Veirs, David Carroll,	*Urbana,*	Mechanical Eng'g.

*Deceased.

Wahl, Henry,	*Sterling,*	Electrical Eng'g.
Wait, Ernest Ludden,	*Urbana,*	Chemistry.
Warner, Harry Jackson,	*Prophetstown,*	Chemistry.
Whelpley, Cecilia,	*Cobden,*	Natural Science.
Williams, Ralph Joseph, A.B. *(Knox Coll.)*, 1897,	*Galesburg,*	Architecture.
Willson, Hiram Everett,	*Carbondale,*	Mechanical Eng'g.
Wright, Sidney Walter,	*Atlanta,*	General, L. and A.
Zipf, Ferdinand,	*Hopedale,*	Mathematics.
Zuck, Cassius Harmond,	*Rockford,*	Mechanical Eng'g.

FRESHMAN

Ahrens, Anna Wilhelmina,	*Champaign,*	General, L. and A.
Allen, Edith Louise,	*Delavan,*	Natural Science.
Alspach, Fred Albert,	*Mt. Pulaski,*	Civil Engineering.
Ashley, George Edwin,	*Urbana,*	Natural Science.
Bader, Will John,	*Quincy,*	Chemistry.
Bamberger, George Washington,	*Chicago,*	Agriculture.
Barackman, Guy Bernard,	*Streator,*	Civil Engineering.
Barr, John,	*Urbana,*	Civil Engineering.
Bassett, Frank Deloss,	Kewanee,	Architectural Eng'g.
Beebe, Florence Jennie,	*Blunt, S. Dak.,*	General, L. and A.
Beers, LeRoy Fitch,	*North Harvey,*	Electrical Eng'g.
Bell, Arthur Timothy,	*Azotus,*	Mathematics, L. and A.
Berfield, Clyde,	*Toulon,*	Natural Science.
Berger, Donald Forbes,	*Anna,*	Agriculture.
Berger, William Louis,	*Geneseo,*	Civil Engineering.
Bidwell, Carlyle Dickerman,	*Chicago,*	Electrical Eng'g.
Block, Edgar William,	*Sidney,*	Civil Engineering.
Bopp, William George,	*Chicago,*	General, L. and A.
Boudinot, Eugene Stimson,	*Danville,*	Municipal Eng'g.
Boyd, Edward Parkman,	*Aledo,*	Architecture.
Bramhall, Robert Nicholas,	*Chicago,*	Electrical Eng'g.
Brookie, Frank McCord,	*Vincennes, Ind.,*	Civil Eng'g.
Brookings, Louise Roberts,	*DuQuoin,*	General, L. and A.
Brown, Lewis,	*Rockford,*	Electrical Eng'g.
Bruce, Robert Charles,	*Joliet,*	Mechanical Eng'g.
Buell, Edward Thomas,	*Chicago,*	Electrical Eng'g.
Burnham, Edna Sophia,	*Dixon,*	Natural Science.
Busey, Paul Graham,	*Urbana,*	Natural Science.
Cadwell, Charles Nickerson,	*Urbana,*	General, L. and A.

Cambridge, Louis,	*Champaign,*	Math. and Physics.
Canmann, Harry Louis,	*Chicago,*	Civil Engineering.
Carson, Thomas Francis,	*Urbana,*	Natural Science.
Carter, William Curtis,	*Homer,*	Electrical Eng'g.
Chamberlain, Mary Chase,	*Topeka, Kas.,*	Science.
Chapin, Arlo,	*Champaign,*	General, L. and A.
Clark, Elwyn Lorenzo,	*Momence,*	Civil Engineering.
Clark, Emma Alberta,	*Sidney,*	General, L. and A.
Clark, Thomas Aquilla,	*Sidney,*	Electrical Eng'g.
Clarke, Roger Newman,	*Farmington,*	Electrical Eng'g.
Clarke, Victor Hugo,	*Quincy,*	Mechanical Eng'g.
Clayton, Clark Mensch,	*Dixon,*	Municipal Eng'g.
Collier, Ben Harrison,	*Gibson City,*	General, L. and A.
Condit, Jay Sidney,	*Beardstown,*	Political Science.
Cook, James Fitchie,	*Dundee,*	Mechanical Eng'g.
Cook, William Adelbert,	*Neponset,*	General, L. and A.
Coombe, Harry N,	*Arcola,*	Agriculture.
Cornell, Grace Margaret,	*Streator,*	Philosophy, L. and A.
Cottingham, William Stillman Chapin,	*Lincoln,*	Agriculture.
Cowley, Thomas Philip,	*Rockford,*	Mechanical Eng'g.
Cummings, Wilber Judd,	*Sparta, Mich.,*	Architecture.
Dadant, Louis Charles,	*Hamilton,*	Mechanical Eng'g.
Davis, George Harvey,	*Charleston,*	General, L. and A.
Dawson, Charles Hubbard,	*Bement,*	Natural Science.
Day, Charles Phillip,	*Urbana,*	Mechanical Eng'g.
Dedman, Bryant,	*Sullivan,*	Mechanical Eng'g.
DeMotte, Roy James,	*Urbana,*	Natural Science.
DeMotte, Ruby Thorne,	*Urbana,*	Natural Science.
Dills, Eve Idelle,	*Decatur,*	Natural Science.
Dinwiddie, Elizabeth,	*Champaign,*	Architecture.
Dobbins, Ethel Irene,	*Champaign,*	General, L. and A.
Doty, Lee Boone,	*Savanna,*	Math. and Physics.
Drake, Jeannette Mae,	*Decatur,*	General, L. and A.
Draper, Charlotte Enid,	*Hakodate, Japan,*	General, L. and A.
Draper, Edwin Lyon,	*Urbana,*	Chemistry.
Drury, Clair Fred,	*New Boston,*	Architecture.
Duffy, Guy,	*Ottawa,*	Political Science.
Ealey, Minnie,	*Urbana,*	Music.
Edwards, Harry,	*Dixon,*	Math. and Physics.
Edwards, Ralph Owen,	*Belleflower,*	General, L. and A.
Engstrom, Ella Victoria,	*Peoria,*	Natural Science.

Farrar, Floyd Judson,	*Downers Grove,*	Civil Engineering.
Farrin, James Moore,	*Cairo,*	Electrical Eng'g.
Fleming, Rose Eilene,	*Bennett,*	General, L. and A.
Fleming, Virgil R,	*Denver,*	General, L. and A.
Forbes, Ethel Clara Schuman,	*Urbana,*	General, L. and A.
Francis, Oscar Jefferson,	*Omaha, Neb.,*	Architectural Eng'g.
Frazer, Joanna Vera,	*Springfield,*	General, L. and A.
Frazier, James William,	*Bushton,*	Natural Science.
Fullenwider, Thomas Irvin,	*Mechanicsburg,*	Civil Eng'g.
Fullerton, Hugh Regnier,	*Havana,*	General, L. and A.
Fulton, Robert Bruce,	*Hartford City, Ind.,*	Civil Eng'g.
Fursman, William Hiram,	*El Paso,*	Civil Engineering.
Gaffin, Benjamin Hiestand,	*Leaf River,*	Agriculture.
Garver, Lewis Cormany,	*Rockford,*	Civil Engineering.
Gaston, Ralph Mayo,	*Normal,*	Electrical Eng'g.
Gilkerson, Aletha,	*Hampshire,*	Natural Science.
Gillespie, Belle Irene,	*Champaign,*	General, L. and A.
Gillespie, Louella Ida,	*Champaign,*	Music.
Gilster, Conrad George,	*Chester.*	Electrical Eng'g.
Goff, Mary Emma,	*Rantoul,*	General, L. and A.
Gramesly, Margaret Amidon,	*Charleston,*	General, L. and A.
Greenman, Edwin Gardner,	*Champaign,*	Mechanical Eng'g.
Grimm, Clifford Ernest,	*Canton,*	General, L. and A.
Griswold, Lewis Edwin,	*Blue Mound,*	Agriculture.
Hall, Augusta Maude,	*Urbana,*	General, L. and A.
Hampton, Leon Edward,	*Fowler, Ind.,*	Agriculture.
Hanna, Max Ross,	*Rushville,*	Electrical Eng'g.
Hannah, Calvin Richard,	*Chrisman,*	Natural Science.
Harman, John James,	*Milford,*	Civil Engineering.
Harpole, Byron,	*Champaign,*	Electrical Eng'g.
Harris, Chester Ellis,	*Ogden,*	Natural Science.
Harris, Thaddeus Sidney,	*Modesto,*	Natural Science.
Harris, Thomas Luther,	*Modesto,*	General, L. and A.
Harshman, Lucius Romaine,	*Sullivan,*	Classical.
Hartford, Elmer Ellsworth,	*Arcola,*	Mechanical Eng'g.
Harvey, Raymond Wade,	*Griggsville,*	Natural Science.
Hatch, Walter Ray,	*Goshen, Ind.,*	Civil Engineering.
Hayward, Minnie,	*Elgin,*	General, L. and A.
Henderson, Alexander,	*Chicago,*	Classical.
Henderson, Robert, Jr.,	*Buchanan, Mich.,*	Natural Science.
Herdman, Luella Mary,	*Monmouth,*	Art and Design.

Herrick, Lyle George,	*Farmer City,*	General, L. and A.
Herrick, Dwight Orson,	*Farmer City,*	General, L. and A.
Higgins, Gertrude Stansfield,	*El Paso, Tex.,*	Music.
Higgins, Samuel Chase,	*El Paso, Tex.,*	Mechanical Eng'g.
Hill, Robert Crawford,	*Canandaigua, N. Y.,*	Nat. Science.
Hinckley, George Clifford,	*Aurora,*	Chemistry.
Hintze, William Daggett,	*Elgin,*	General, L. and A.
Hobart, Harry Edwin,	*Armington,*	General, L. and A.
Holmes, Alfred Edwin,	*Bradford,*	Civil Engineering.
Hoover, Harry Harold,	*Pontiac,*	Chemistry.
Hopkins, Mabel,	*Indianapolis, Ind.,*	General, L. and A.
Horner, Harlan Hoyt,	*Cerro Gordo,*	General, L. and A.
Hostetter, Abram,	*Mt. Carroll,*	General, L. and A.
Howe, Harriet Emma,	*Urbana,*	General, L. and A.
Howlett, Royal Sheffler,	*Trinidad, Colo.,*	Architecture.
Hunter, Charles Phelps,	*Newton, Iowa,*	General, L. and A.
Ijams, Catherine Harriet,	*Urbana,*	Science.
Jarman, Henry Phelps,	*Elmwood,*	Chemistry.
Jarman, Thomas Henry, Jr.,	*Greensboro, Md.,*	Electrical Eng'g.
Jefferson, Roy Trend,	*Springfield,*	Mechanical Eng'g.
Johnson, Fred Vallentine,	*Champaign,*	Mechanical Eng'g.
Johnson, John Peter,	*Hamilton, Iowa,*	Electrical Eng'g.
Jutton, Lee,	*Champaign,*	Civil Engineering.
Kable, Charles Howard,	*Virden,*	Architecture.
Kable, Russell Freeman,	*Virden,*	Mechanical Eng'g.
Lamkin, Grace Minerva,	*Champaign,*	General, L. and A.
Landon, Truman Harry,	*Jerseyville,*	Architectural Eng'g.
Lautz, Walter Ernest,	*Pekin,*	Mechanical Eng'g.
Lindgren, Justa Morris,	*Moline,*	General, L. and A.
Linzee, Fred Norton,	*DuQuoin,*	Electrical Eng'g.
Logan, Harry Ralph,	*Arcola,*	General, L. and A.
Lundgren, Carl Lee,	*Marengo,*	Civil Engineering.
McCarthy, Harry,	*Moline,*	Mechanical Eng'g.
McCracken, George Milas,	*Pana,*	Architecture.
McCulloch, Albert Barnes,	*St. Louis, Mo.,*	Natural Science.
McGinnis, Mary Ola,	*Dawson,*	Natural Science.
McIntosh, Kathryn Eleanor Annie,	*Champaign,*	General, L. and A.
McVay, Camden Jacob,	*Champaign,*	Mechanical Eng'g.
Malcolm, Charles Wesley,	*Roseville,*	General, L. and A.
Manspeaker, Pearle,	*Champaign,*	General, L. and A.
Mapes, John Victor,	*Paris,*	Chemistry.

Martin, Albert Carey,	*LaSalle,*	Architectural Eng'g.
Martin, Webb Wilde,	*Jerseyville,*	Chemistry,
Mather, Jennie Maria,	*East Wheatland,*	General, L. and A.
Mathews, Clyde Milton,	*Urbana,*	General, L. and A.
Mathis, Roy Hayes,	*Prophetstown,*	Natural Science.
Matthews, Robert Clayton,	*Monmouth,*	Mechanical Eng'g.
Maxwell, Esther Anna,	*Champaign,*	General, L. and A.
Means, Clara Adeline,	*Stevens Point, Wis.,*	General, L. and A.
Meier, William,	*Chicago,*	Civil Engineering.
Merrill, Orland Paul,	*Elgin,*	Natural Science.
Mills, Ralph Garfield,	*Decatur,*	Natural Science.
Monier, Sara,	*Champaign,*	General, L. and A.
Moore, Claude Bliss,	*Kankakee,*	Electrical Eng'g.
Moran, Mark Asher,	*Canton,*	Electrical Eng'g.
Murphy, John Campbell,	*Long Grove, Ia.,*	Chemistry.
Neikirk, John Oscar,	*Forest City,*	Mechanical Eng'g.
Neill, Robert Park,	*Sparta,*	Electrical Eng'g.
Neville, Russell Trall,	*Kewanee,*	Natural Science.
Newbold, Theodore Aubrey,	*Joliet,*	Mechanical Eng'g.
Newman, James Christopher,	*Sparta,*	Electrical Eng'g.
Norris, Carter,	*Farmer City,*	General, L. and A.
Parker, Lawrence Gilbert,	*Toluca,*	Civil Engineering.
Patrick, Jessie May,	*Logansport, Ind.,*	General, L. and A.
Perkins, Nellie,	*Vienna,*	General, L. and A.
Pilcher, Lela Gretchen,	*Streator,*	Math. and Science.
Plant, Francis Benjamin,	*Champaign,*	Chemistry.
Poor, Edwin Lindsay,	*Streator,*	Natural Science.
Post, Hiram Franklin,	*Rock Rapids, Ia.,*	Electrical Eng'g.
Price, Hugh Mitchel,	*Champaign,*	Civil Engineering.
Ranson, Clara Ann,	*Havana,*	General, L. and A.
Read, Edgar Newton,	*Urbana,*	Chemistry.
Reasoner, Clara Beck,	*Seymour,*	Natural Science.
Reeves, George I,	*Wauponsee,*	Natural Science.
Riley, Anna Bethiar,	*Urbana,*	General, L. and A.
Roa, William John,	*Edwardsville,*	Architectural Eng'g.
Robinson, James John,	*Marshall,*	Natural Science.
Rolfe, Susie Farley,	*Champaign,*	Natural Science.
Rose, Alice,	*Oak Park,*	General, L. and A.
Roy, Robert Oscar,	*Anna,*	Electrical Eng'g.
Salladay, George Roy,	*Homer,*	Math. and Physics.
Samson, George Roy,	*Urbana,*	General, L. and A.
Sanders, Theodore Marcus,	*Little Rock, Ark.,*	Architecture.

Sawyer, Donald Hubbard,	*Oak Park,*	Municipal Eng'g.
Schreiner, Harry,	*Rock Island,*	Architectural Eng'g.
Schulte, Mabel,	*Hopedale,*	General, L. and A.
Schumacher, Tillie Joe,	*Champaign,*	General, L. and A.
Schwartz, Albert John,	*Dallas City,*	Civil Engineering.
Seymour, Ernest DeLacey,	*Dwight,*	Natural Science.
Shawhan, William Warren,	*Champaign,*	Civil Engineering.
Shea, Willard Wright,	*Danville,*	General, L. and A.
Shimmin, Robert Philip,	*Rockford,*	Mechanical Eng'g.
Slocumb, Edward Clyde,	*Keithsburg,*	Civil Engineering.
Smith, Anna Mary,	*Dixon,*	General, L. and A.
Smith, Claude Frederick,	*Marengo,*	General, L. and A.
Smith, Nelle Cynthia,	*Arcola,*	General, L. and A.
Snodgrass, John McBeath,	*Urbana,*	Mechanical Eng'g.
Stanley, Otis Orion,	*Champaign,*	Natural Science.
Stedman, Jeannette,	*Champaign.*	Music.
Steely, George,	*Danville,*	General, L. and A.
Stoltey, Pansy Blossom,	*Champaign,*	Music.
Storms, Mabel Moore,	*Fairport, N. Y.,*	General, L. and A.
Summerhays, William Arthur,	*Chicago,*	Civil Engineering.
Sutter, John Henry, Jr.,	*Chicago,*	Civil Engineering.
Sweet, William Lorraine,	*Champaign,*	Electrical Eng'g.
Talbot, Carrie E,	*Plymouth,*	Classical.
Taylor, John Orlo,	*Hayes,*	Math. and Physics.
Tenney, Charles Frederick, Jr.,	*Bement,*	General, L. and A.
Thompson, Evangeline Louise,	*Bement,*	General, L. and A.
Thompson, Frank Linn,	*Champaign,*	General, L. and A.
Thompson, McDonald,	*Isabel,*	Electrical Eng'g.
Thornton, Curt,	*Tuscola,*	Electrical Eng'g.
Thornton, Robert Ingersoll,	*Magnolia,*	Civil Engineering.
Updike, Hector,	*Belleville,*	Electrical Eng'g.
Vance, Edna Cecilia,	*Edwardsville,*	Natural Science.
Wallace, Jacob H,	*Altamont,*	Mechanical Eng'g.
Waterbury, Leslie Abram,	*Polo,*	Civil Engineering.
Watson, Everett,	*Arcola,*	Natural Science.
Webber, Charles Albert,	*Ferris,*	Classical.
Wendell, Francis George,	*New Holland,*	Civil Engineering.
Wentworth, John Lewis,	*Kewanee,*	Mechanical Eng'g.
Wesselhoeft, Charles Dietrich,	*Chicago,*	Electrical Eng'g.
Whitaker, Jesse Lee,	*Kinmundy,*	General, L. and A.
White, James Dunwell,	*Taylorville,*	General, L. and A.
Whitehouse, Edith Ursula,	*Canton,*	Classical.

Whitson, Milton James,	*Davenport, Ia.,*	Architecture.
Wilder, Paul,	*Champaign,*	General, L. and A.
Winkinson, Nathan,	*Emporia, Kas.,*	Electrical Eng'g.
Williams, Elrick,	*Illiopolis,*	Chemistry.
Williams, Seymour,	*Monticello,*	Classical.
Wilson, Thomas,	*Caledonia,*	Electrical Eng'g.
Wolff, Solomon,	*El Paso, Tex.,*	Electrical Eng'g.
Wolleson, Herbert Henry,	*Belleville,*	Architectural Eng'g.
Woodin, Norman Charles,	*Rock Island,*	Mechanical Eng'g.
Woody, Paul Way,	*Champaign,*	Natural Science.
Worsdell, Arthur Eleazar,	*Vermont,*	Civil Engineering.
Wright, Edith,	*Urbana,*	Natural Science.
Zarley, William Hadsall,	*Joliet,*	Civil Engineering.

SPECIALS

Atwood, Frank Howard,	*Dwight,*	Natural Science.
Azbill, Ethel Wolcott,	*Indianapolis, Ind.,*	General, L. and A.
Ainsworth, Nellie Elizabeth,	*Champaign,*	Music.
Bartholomew, Ross,	*Vermont,*	Agriculture.
Beach, Abbie Clair,	*Sioux City, Ia.,*	Music.
Beadle, Lucius,	*Kewanee,*	Chemistry.
Bennett, William Lee,	*Urbana,*	Classical.
Besore, Jessie,	*Urbana,*	Music.
Brown, Mae Ellen,	*Augusta,*	Music.
Brundage, Martin Denman,	*Malta,*	General, L. and A.
Buckley, John,	*Stanford,*	Classical.
Bundy, Ralph Parmer,	*Zionsville, Ind.,*	General, L. and A.
Carter, Ira Calvin,	*St. Charles, Minn.,*	Architecture.
Carter, Opal Gertrude,	*Champaign,*	Natural Science.
Casner, William Allen,	*Earlville,*	Mechanical Eng'g.
Chester, Edith,	*Champaign,*	Art and Design.
Childs, Sue Eva,	*Clinton, Ia.,*	General, L. and A.
Clark, Mrs. Meta Baker,	*Champaign,*	Art and Design.
Clark, William Owen,	*Scottland,*	Mechanical Eng'g.
Conard, Philip Arthur,	*Monticello,*	General, L. and A.
Corson, Frank,	*Marengo,*	Mechanical Eng'g.
Coultas, Albert Leslie,	*Winchester,*	Agriculture.
Craig, Arthur Emanuel,	*Fair Grange,*	General, L. and A.
Crathorne, Annie Ellen,	*Champaign,*	General, L. and A.
Craw, Nellie Edna,	*Sadorus,*	Music.
Crawford, Emma,	*Urbana,*	Music.

Crawford, George Barnes,	*Champaign,*	Music.
Custer, Mae Viola,	*Danville,*	Music.
Dadant, Valentine Marie,	*Hamilton,*	General, L. and A.
Davis, Ida Belle,	*Bondville,*	General, L. and A.
Davis, Cleon Leslie,	*Mt. Zion,*	Civil Engineering.
Dillon, Gertrude Sempill,	*Sheldon,*	General, L. and A.
Dole, Sarah,	*Mattoon,*	General, L. and A.
Draper, Charlotte Leland,	*Urbana,*	Music.
Duncan, Henry Lyle,	*Washington, Ind.,*	Architecture.
English, Edward Cary, Jr.,	*Anna,*	Architectural Eng'g.
Ennis, George Harrison,	*Decatur,*	Chemistry.
Enochs, Delbert Riner, A.B., 1898,	*Champaign,*	Music.
Fenner, Edith L,	*Urbana,*	Music.
Flanigan, Bessie Marie,	*Champaign,*	Music.
Fleming, George K,	*Denver,*	General, L. and A.
Fleming, Marcella Augusta,	*Bement,*	Music.
Fleshman, Arthur Cary,	*Bagdad, Ky.,*	General, L. and A.
Ford, Ralph Leo,	*Lewistown,*	Mechanical Eng'g.
Frazier, Elmer Allen,	*Champaign,*	General, L. and A.
Garwood, Mabel Clare,	*Augusta,*	Art and Design.
Gearhart, Orval Lee, B.S., 1897,	*Farmer City,*	Civil Engineering.
Gensel, Mrs. Martha Eleanor,	*Urbana,*	Music.
Gere, Clara,	*Champaign,*	Music.
Girty, Maude,	*Urbana,*	Music.
Green, Edward Clarence, B.S., *(Michigan Agricultural College),* 1897,	*Urbana,*	Music.
Grevenkamp, Herman Henry,	*Quackanbruck, Germany,*	Natural Science.
Gridley, Burton E,	*Virginia,*	General, L. and A.
Hahn, Howard Hartford,	*Freeport,*	Architecture.
Hammers, Jesse,	*Champaign,*	General, L. and A.
Hanson, Gertrude Lucie,	*Urbana,*	General, L. and A.
Haüssler, Dwight Francis,	*Centralia,*	Political Science.
Hauter, Andrew Edgar,	*Tiskilwa,*	Political Science.
Hauter, Joseph Elmer,	*Tiskilwa,*	General, L. and A.
Holcomb, Bessie,	*Milmine,*	Music.
Holder, Vernon Milner,	*Normal,*	Architecture.
Huff, Nolan Hynson,	*Centre,*	General, L. and A.
Hughes, Davis Everett,	*Pinkstaff,*	General, L. and A.
Hurlbert, Nina Elouise,	*Morrison,*	Music.

Huston, Frank Derr,	*Virden,*	Mechanical Eng'g.
Hutchinson, Frank,	*Olney,*	Civil Engineering.
Ice, Laura Frances,	*Gifford,*	Music.
Irwin, Herbert Ellwood,	*Galesburg,*	Mechanical Eng'g.
Jayne, Violet Delille, A.M. *(University of Michigan)*, 1896,	*Urbana,*	Music
Johnson, Clarence Eugene,	*Champaign,*	General, L. and A.
Jones, Fred Earl,	*Cerro Gordo,*	Electrical Eng'g.
Kable, Mary Alice,	*Virden,*	Music.
Kemp, George Theophilus, M.D., Ph.D.,	*Champaign,*	Music.
Ketzle, Henry Benjamin,	*Reynolds,*	Electrical Eng'g.
Killam, Samuel Eugene,	*Carlinville,*	Electrical Eng'g.
Kratz, Laura, A.B., 1897,	*Monticello,*	General, L. and A.
Latzer, Alice Bertha,	*Highland,*	Natural Science.
Lee, Kittie Grace,	*Homer,*	Music.
LeFevre, Ervilla Belle,	*Urbana,*	Music.
Loeffler, Katherine Armina,	*Ogden,*	Music.
McClenathan, Effie Elma,	*Fairmount,*	Art and Design.
McConnell, Cecilia B.	*Winnetka,*	Library.
McGinnis, Cora Nell,	*Dawson,*	General, L. and A.
McIntosh, Mabel Charlotte Urquhart,	*Champaign,*	Music.
McIntyre, Margaret Pearl,	*Newman,*	Music.
McLane, Elmer Cavett,	*Allerton, Ia.,*	Classical.
McReynolds, Dora Genevra,	*Bethany,*	General, L. and A.
Mandeville, Elizabeth Elma,	*Philo,*	General, L. and A.
Messer, Harry,	*Charleston,*	General, L. and A.
Milne, David Haxton,	*Cairo,*	Art and Design.
Mojonnier, Timothy,	*Highland,*	Chemistry.
Mount, Madison Hoge,	*Walnut Prairie,*	Mechanical Eng'g.
Nash, Benjamin Franklin, Jr.,	*Champaign,*	Music.
Needham, John Lowry,	*Neoga,*	Natural Science.
Neikirk, Oren Herschel,	*Forest City,*	General, L. and A.
Odbert, Alice Bradway,	*Indianola,*	Music.
Parsons, Delta Maye,	*DeLand,*	Music.
Parsons, Margaret May,	*Ludlow,*	Music.
Payne, Rinnie Camille,	*LeRoy,*	Music.
Peacock, Lottie Belle,	*Bloomington,*	Music.
Plunkett, Rollin Azel,	*Trimble,*	Natural Science.
Porterfield, Jessie Belle,	*Champaign,*	Music.
Quirk, Elizabeth,	*Champaign,*	Music.

Reed, Mrs. Adele Cooper,	*Paxton,*	Library.
Russian, Hovhannes,	*Harpoot, Turkey,*	Chemistry.
Sawyer, George Kingsley,	*Carpentersville,*	Mechanical Eng'g.
Schillinger, Josephine,	*Moline,*	General, L. and A.
Scott, Vera Charlotte,	*Mahomet,*	General, L. and A.
Seymour, Roy Vincent,	*Dwight,*	General, L. and A.
Shelton Addison M,	*Loami,*	General, L. and A.
Short, Ulysses Sheridan,	*Filmore,*	General, L. and A.
Sirpless, Lora,	*Champaign,*	Music.
Smick, Mary Ella,	*Athens,*	Music.
Smith, Allie Crawford,	*Genoa,*	Electrical Eng'g.
Smith, Helen Amelia,	*Sidney,*	Music.
Spink, Charles Raymond,	*Davenport, Ia.,*	Architecture.
Stave, Edith,	*Champaign,*	Music.
Stockton, Lalla Rookh,	*Burlington, Ind.,*	General, L. and A.
Stoner, Inez Amanda,	*Paxton,*	Art and Design.
Stratton, Isaac Harry,	*Toulon,*	Natural Science.
Swanberg, Floyd Ludwig,	*Danville,*	Electrical Eng'g.
Taggert, Anna, A.M. *(Shurtleff Coll.),* 1897,	*Upper Alton,*	General, L. and A.
Taylor, Dalla Alice,	*Hays,*	General, L. and A.
Thatcher, Alice Neta,	*Decatur,*	Art and Design.
Thomas, William Frederick,	*Bradford,*	General, L. and A.
Thompson, Mrs. Dora Belle,	*Yates City,*	Music.
Thompson, Willard Carr,	*Canton,*	Agriculture,
Thordenberg, Fred Moses,	*Rock Island,*	Architecture.
Tillotson, Mabel,	*Kinder, La.,*	Music.
Tumbleson, Alvin Truesdell,	*Harrisonville, Mo.,*	Architecture.
Wagner, James Irwin,	*Sumner,*	General, L. and A.
Ward, Guy Warren,	*Champaign,*	Agriculture.
Wead, Urith Lois,	*Paris,*	General, L. and A.
Weaver, Edith Maria,	*Urbana,*	Music.
Weeks, John Riley,	*Quincy,*	Mechanical Eng'g.
Wever, John Emile,	*Clayton,*	General, L. and A.
White, Joseph Pius,	*Danville,*	Architecture.
White, William Elmer,	*Pana,*	Political Science.
Williamson, Josephine Hulda,	*Champaign,*	Music.
Wilson, Love Frances,	*Guthrie,*	Music.
Wright, Beatrice Ellen,	*Champaign,*	Music.
Wright, William Wilberforce, Jr.,	*Toulon,*	General, L. and A.
Zwisler, Joseph Edwin,	*Canton,*	Electrical Eng'g.

STUDENTS AT BIOLOGICAL STATION, HAVANA, JUNE-AUGUST, 1898.

Baldwin, Anna Laura,	*Pittsfield.*
Cook, Thomas Lee,	*Mt. Pulaski.*
Craig, Wallace, B.S., 1898,	*Chicago.*
Dewey, Louise Sarah, B.S., 1897,	*Urbana.*
Faust, Clarence Clermont,	*Mansfield,*
Garber, John Frederick, A.B., 1897,	*Houston, Tex.*
Johnson, John Thomas,	*Galesburg.*
Kofoid, Nellie Ione, B.S., 1898,	*Normal.*
Meharry, Jesse Erle,	*Tolono.*
Pierce, Mrs. Sarah Elizabeth,	*Havana.*
Praeger, William Emilius,	*Keokuk, Iowa.*
Pratt, Lanson Henry,	*Delavan.*
Sehacht, Frederick William, M.S., 1898,	Moline,
Widmann, Otto,	*Old Orchard, Mo.*
Young, Charles Whittier, B.S., 1897,	*Chicago.*

WINTER SCHOOL IN AGRICULTURE—1899

Adams, Guy Taylor,	*Elgin.*
Alton, John Russell,	*Grand Tower.*
Arnott, LeRoy,	*Paxton.*
Benson, Wilbur John,	*Kempton,*
Bines, Robert Scott,	*Ridge Farm.*
Burke, Benjamin,	*Champaign.*
Callaway, Leonard Wyeth,	*Tuscola.*
Colby, William Davis, Jr.,	*Atkinson,*
Engelmann, Julius,	*Shiloh,*
Finch, Jesse Peter,	*Verona.*
Gardner, Thomas Andrew,	*Beason.*
Gaul, Jacob Melvan,	*Cadwell,*
Householder, Fred, Jr.,	*Fairbury.*
Hubbard, Fred Clark,	*Urbana.*
Hunter, William Ferguson,	*Geneseo.*
Kincaid, Archie Simpson,	*Champaign.*
Leas, Elmer Edwin,	*Stone Bluff, Ind.*
Mather, Charles Asa,	*Joliet.*
Mullin, Stephen,	*Urbana.*
Nicholson, Joseph,	*Lee Center.*

Pfingsten, Fred William,	*Meacham.*
Prusz, Henry Louis,	*Johannisburg.*
Scott, Philip Collins,	*Kempton.*
Smith, Charles Ernest,	*Rossville.*
Smith, Raymond Whitfield,	*Farmer City.*
Werd, Charles Lower,	*Lanark.*

SCHOOL OF LAW

THIRD YEAR

Donoghue, Richard Charles,	*LaSalle.*
Trapp, Harold Frederick,	*Lincoln.*

SECOND YEAR

Adams, Otto C,	*Cerro Gordo.*
Armstrong, J Lattrell,	*Urbana.*
Baker, Zion Frost,	*Sullivan.*
Barrett, George Francis,	*Chicago.*
Boyd, Hobart Sherman,	*Lewistown.*
Cooper, Fred Worth,	*Champaign.*
Dougherty, Horace Raymond, A.B. *(Univ. of Chicago)*, 1896,	*Peoria.*
Douglass, Reuben S, A.B. *(Marietta Coll.)*,	*Champaign.*
Dunseth, James Morten,	*Urbana.*
Glenn, Leslie Leland,	*Champaign.*
Glenn, Otis Ferguson,	*Champaign.*
Grossberg, Harry Altman,	*Chicago.*
Hughes, Arlington H,	*Mattoon.*
Kennard, Perry Garst,	*Champaign.*
Ketchum, Margaret Adéle,	*LaPrairie.*
Lamet, Louis Harman,	*Warsaw.*
Latch, Fred Everett,	*Atwood.*
May, Fred Hutchinson,	*Prophetstown.*
Mulliken, Albert Danforth,	*Champaign.*
Ostrowski, Samuel,	*Chicago.*
Philips, Thomas Lewis,	*Belvidere.*
Pontious, Ralph Woods,	*Macomb.*
Rhodes, Edward Melvin,	*Bloomington.*
Schaefer, Peter Philip,	*Carlyle.*
Trevett, John Howard,	*Champaign.*
Van Brundt, Chester S,	*Champaign.*
Wesemann, Adolph Henry,	*LaGrange.*
Winkler, Frank Crawford,	*Oakland.*

FIRST YEAR

Adsit, Bertram Wilson,	*Wellington.*
Boggs, Oliver Carter,	*Urbana.*
Borden, William Thomas,	*Chicago.*
Boyd, John William,	*Rantoul,*
Brittingham, Harry Lee,	*Danville.*
Church, Floyd Franklin,	*Jacksonville.*
Dolan, William John,	*Ohio.*
Dougherty, Ralph Leland, A.B. *(Univ. of Chicago)*, 1897,	*Peoria.*
Elder, Roy Samuel,	*Streator.*
Evans, Waldo Carl,	*Danville.*
Fulton, William John, A.B., 1898,	*Hartford City, Ind.*
Gillespie, Hiram, A.B. *(Univ. of Chicago)*, 1898,	*Lincoln.*
Griffin, Roy Hawks,	*Polo.*
Hall, Arthur Raymond,	*East Lynn.*
Howard, Joseph,	*Urbana.*
Humphrey, Wallace George,	*Hamilton.*
King, Jacob Weinberg,	*Augusta.*
Kuhn, Leopold,	*Champaign.*
Lego, Lulu Mackintosh,	*Urbana,*
McCollum, Harvey Darling,	*Louisville.*
Null, Louis Agassiz,	*Blandinsville.*
Padget, Will Marion,	*Palmyra.*
Perkins, Frederic Allen,	*Canton.*
Polk, Cicero Justice, A.B., 1898.	*Champaign.*
Post, Herbert Earl,	*Springfield.*
Remann, Frederick Gordon,	*Vandalia.*
Sherman, William Horace,	*Sullivan.*
Stevenson, Amos Milton,	*Ottawa.*
Thompson, George Mershon,	*Bement.*
Tunnecliffe, John James, Jr.,	*Galesburg.*
Vonderlieth, Henry Louis,	*Mt. Pulaski.*
Waite, Will Clarence,	*Danville.*
Wilder, Frank,	*Champaign.*
Wingard, Lewis Forney,	*Champaign.*

SPECIALS

Bridge, Horace Lawrence,	*Solsville, N. Y.*
Coffman, Harry Augustus,	*Champaign.*
Craig, James Wesley,	*Mattoon.*

Crouch, William Liebrick,	*Rosetta.*
Hunsley, Frank Sherman,	*Champaign.*
Lorenson, John Hanson,	*Lovington.*
Riley, James Charles,	*Bloomington.*

SCHOOL OF MEDICINE

(COLLEGE OF PHYSICIANS AND SURGEONS OF CHICAGO)

SENIOR CLASS

Albrecht, Charles A., Ph.G. *(Chicago Coll. Pharmacy)*, 1890,	*Minnesota.*
Andrews, Hubert Franklin, B.S. *(Univ. of Illinois)*, 1893,	*Utah.*
Backus, J. W.,	*Michigan.*
Barker, Ernest S., A.M. *(Univ. of Manitoba)*, 1897,	*Manitoba.*
Barnes, Frederic Louis,	*Iowa.*
Bay, Hiram Horace,	*Illinois.*
Bechtold, August F.,	*Illinois.*
Beedy, Lora Lucille,	*Pennsylvania.*
Best, E. E., M.D. *(Chicago Homeopathic Coll.)*, 1896,	*Iowa.*
Betz, Jonathan Clymant,	*Illinois.*
Brewer, Edwin Jason,	*Illinois.*
Brown, J. M.,	*Illinois.*
Browning, George Stillman, B.S. *(Alfred Univ.)*, 1896,	*Rhode Island.*
Burke, Thomas Jerome,	*Iowa.*
Bush, John Harvey, Ph.M. *(Austin Coll.)*, 1896,	*Illinois.*
Butkiewicz, Kasimir A., A.B., Ph.G. *(Moscow Univ.)*, 1882,	*Illinois.*
Butler, Clarence Albert,	*Illinois.*
Campbell, William B., M.D. *(Milwaukee Medical School)*, 1898.	*Wisconsin.*
Carroll, Henry Colistis,	*Illinois.*
Chambers, William Henry, M.D. *(Ohio Medical Univ.)*, Ph.B. *(Mount Hope College)*,	*Pennsylvania.*

Chloupek, Elton Arthur,	*Wisconsin.*
Coen, Charles Morgan,	*Illinois.*
Crosby, Leonard Green,	*Minnesota.*
Czarra, Conrad Howard,	*Illinois.*
Dolan, Felix A.,	*Iowa.*
Dugan, James Henry,	*Maryland.*
A.B. *(Georgetown Univ.)*, 1896,	
Edwards, John Milton,	*Minnesota.*
Fantus, Bernard,	*Illinois.*
Feingold, Leon,	*Illinois.*
Fellows, Marie A.,	*Missouri.*
Fisher, George Carl,	*Michigan.*
Frank, Ira,	*Illinois.*
Freas, Frank Lesley,	*Illinois.*
Fukala, Carlos,	*Austria.*
Garth, James W.,	*Iowa.*
Gathman, Henry F. A.,	*Illinois.*
Goggins, Robert,	*Wisconsin.*
Grabowicz, Bronislaus Casimir,	
Ph.M. *(Vienna, Austria)*, 1887,	*Illinois.*
Grimes, John P.,	
Ph.G. *(Northwestern Univ.)*, 1895.	*Illinois.*
Harris, Frederick G.,	*Illinois.*
Hammond, James Lloyd,	*Indiana.*
Heald, Harvey C.,	
B.S. *(Univ. of Nebraska)*, 1896,	*Nebraska.*
Herzog, Albert Edmund,	*Ottawa.*
Hillard, Thomas R.,	
A.B. *(Grove City Coll.)*,	*Pennsylvania.*
Hillebrand, Henry J.,	*Illinois.*
Hisom, Helen Taylor,	*California.*
Hukill, Hannah Luella,	*Illinois.*
Hummell, Charles C.,	
Ph.G. *(Chicago Coll. of Pharmacy)*, 1892.	*Iowa.*
Hunter, Mary Gill,	
B.S. *(Ohio Univ.)*, 1882; M.D., *(Cleveland Univ. of Med. and Surg.)*, 1896,	*Iowa.*
Jacobson, August,	
Ph.G. *(Chicago Coll. of Pharmacy)*, 1880,	*Illinois.*
Janss, Herman,	*California.*
Kay, Abbott Elliott,	*Illinois.*

Kelly, L. H.,	*Indiana.*
Kelsey, Russell Calvin,	*Illinois.*
Klein, Matthias Joseph,	*Illinois.*
Klokke, William Emil,	*Illinois.*
Knudson, Frank Benjamin,	*Illinois.*
Koeneman, Eugene O., Ph.G. *(Drake Univ.)*, 1889,	*Iowa.*
Krueger, Albert G.,	*Texas.*
Kunitoma, N., M.D.,	*Illinois.*
Lafferty, Thomas D.,	*Illinois.*
Lee, Alfred O., M.D.,	*Illinois.*
Lemke, A. R.,	*Illinois.*
Lenard, Robert, Ph.G.,	*Illinois.*
Lerch, William Henry,	*Iowa.*
Lockie, G. D.,	*Illinois.*
Long, William E.,	*Iowa.*
Long, R. D.,	*Colorado.*
Lucas, David E.,	*Illinois.*
McCarthy, Robert Groves,	*Washington.*
McClung, Alberta V., M.D.,	*Minnesota.*
McCormick, Charles Alfred, M.D. *(Illinois Medical Coll.)*, 1898,	*Illinois.*
McWilliams, Oscar E.,	*Pennsylvania.*
Macy, Otto E., Ph.G. *(Univ. of Iowa)*, 1896,	*Iowa.*
Madajesky, Ernest Henry, Ph.G. *(Univ. of Wisconsin)*, 1891,	*Michigan.*
Maskey, F. F., M.D. *(Milwaukee Medical Coll.)*,	*Wisconsin.*
Metcalf, John E., A.B. *(Indiana Univ.)*, 1893,	*Indiana.*
Meyers, Frank W.,	*Iowa.*
Miller, S. A.,	*Tennessee.*
Mintener, John W.,	*Minnesota.*
Moore, F. D.,	*Illinois.*
Myers, Frederick Wolfgang,	*Iowa.*
Olson, Wilhelm Carolius,	*Minnesota.*
Peters, James A.,	*Iowa.*
Platt, Benjamin Merchant,	*Illinois.*
Pleth, Valdemar, A.B., Ph.B. *(Univ. of Copenhagen)*,	*Illinois.*

Potter, Jesse Young,	*Michigan.*
Ramsey, Frank P.,	*Ohio.*
Raw, Elmer Joseph,	*Iowa.*
Reasoner, Mathew Aaron, B.S. *(Univ. of Illinois)*, 1896,	*Illinois.*
Reich, William Frederic,	*Wisconsin.*
Rich, R. Gilbert, M.D.C. *(Chicago Veterinary Coll.)*, 1893,	*Iowa.*
Richards, Frederick A.,	*South Dakota.*
Russell, Herman Richard,	*Minnesota.*
Sanderson, Philip Gray,	*Michigan.*
Scheib, George F., B.S., *(Heidelberg Univ.,* Tiffin, Ohio), 1892,	*Illinois.*
Schmitt, Gustav, M.D. *(Jenner Medical Coll.)*, 1898.	*Illinois.*
Schoenberg, Albert John,	*Illinois.*
Sisson, Charles Elvin,	*Wisconsin.*
Smith, Thurston, A.M. *(Indiana Univ.)*, 1896,	*Indiana.*
Steele, Frank Bell,	*Illinois.*
Slightam, Clarence Howard,	*Wisconsin.*
Stillians, Arthur William,	*Illinois.*
Strohecker, Samuel Martin, Ph.G. *(Coll. of Pharmacy,* Phil.), 1890,	*Illinois.*
Stuart, John, A.B. *(Balliol Coll.,* Oxford), 1881,	*Scotland.*
Sullivan, Eugene A.,	*Illinois.*
Swanson, John Emil, A.B. *(Augustana Coll.)*, 1896,	*Illinois.*
Taylor, John Richard, B.D. *(Oberlin Coll.)*, 1890,	*Illinois.*
Tieken, Theodore, Ph.G. *(Northwestern Univ.)*,	*Illinois.*
Timm, Edmund Walter, Ph.G. *(Northwestern Univ.)*, 1894,	*Wisconsin.*
Turner, John Harold, A.B. *(Princeton Univ.)*, 1894,	*Iowa.*
Walsh, John L.,	*Illinois.*
Wanicek, Edward Mathias, M.D.,	*Illinois.*
Weber, Carl E.,	*Illinois.*
Weichbrodt, Ernst August, M.D.,	*Illinois.*

Wenzel, John Valentine,	
Ph.G. *(Northwestern Univ.)*, 1895,	*Illinois.*
Whitmore, E. R.,	
B.S. *(Univ. of Wisconsin)*, 1896,	*Wisconsin.*
Wier, Wood W.,	
A.B. *(Hillsdale Coll.)*, 1895,	*Indiana.*
Wherry, James William,	
M.S. *(Iowa Wesleyan Univ.)* 1885,	*Iowa.*
Wilson, Leroy Alvin,	*Indiana.*
Winans, Edward Clark,	
A.B. *(Univ. of Michigan)*, 1893,	*Michigan.*
Wood, Glenn,	*Illinois.*
Yeakel, William Kriebel,	
B.S. *(Univ. of Illinois)*, 1895,	*Illinois.*
Yingst, Sally Ann,	*Illinois.*
Zurawski, Kasimir A.,	
Ph.G. *(Univ. of Kieff)*, 1889; A.B. *(Coll. of Philol.,* St. Petersburg), 1891,	*Illinois.*

JUNIOR CLASS

Babcock, Margaret McConnell,	*Pennsylvania.*
Ball, Edmund Joseph,	*Indiana.*
Birkelund, John R.,	
A.B. *(Royal Univ.,* Copenhagen), 1886;	
B.D. *(Royal Univ.,* Copenhagen), 1890.	*Illinois.*
Blackwelder, Fred C.,	
B.S. *(DePauw Univ.)*, 1897,	*Illinois.*
Bland, Morton Wallace,	*Ohio.*
Bloch, Max Emanuel,	*Illinois.*
Brown, Hadley C.,	*Iowa.*
Burke, Edward L.,	*Minnesota.*
Buswell, Clark A.,	*Illinois.*
Carver, Simon Clayton,	*Illinois.*
Cassidy, William Wilson,	*Minnesota.*
Chase, Mrs. Barbara West,	*Minnesota.*
Church, Elwin Otis,	*South Dakota.*
Clark, Orson Whitney,	*Iowa.*
Corbus, Burton Robison,	*Illinois.*
DeVault, Asa Nathan,	
Ph.G. *(Northwestern Univ.)*, 1893,	*Illinois.*
DeVoe, Charles Allen,	*Wisconsin.*

Donovan, J. P.,	*Wisconsin.*
Dowdall, Guy Grigsby,	
B.L. *(Univ. of Missouri)*, 1897,	*Illinois.*
Dryden, William Francis,	*Illinois.*
Dysart, Robert Jones,	
A.B. *(Lake Forest Univ.)*, 1893,	*Wisconsin.*
Early, Calvin Sylvester,	*Ohio.*
Flippin, George Albert,	*Illinois.*
Freeman, John Peter,	*Minnesota.*
Gaul, Adolph Carl Adam,	
Ph.G. *(Wurzburg Univ.)*,	*Illinois.*
Gausel, Edward Arthur,	*Wisconsin.*
Geiger, Arthur Henry,	*Illinois.*
George, Abel Benson,	*Iowa.*
Gilmore, Clifford Freeman,	
B.S. *(Oberlin)*, 1897,	*Ohio.*
Green, Mary Emily,	*Illinois.*
Greenfield, Sadie Elaine,	
A.B. *(Univ. of Kansas)*, 1897,	*Kansas.*
Grinnell, Wendell,	*Wisconsin.*
Halloin, Louis Joseph,	*Wisconsin.*
Hamilton, Howard B.,	
A.B. *(Monmouth Coll.)*, 1897,	*Iowa.*
Hannon, Horace Blake,	
Ph.G. *(Univ. of the South)*, 1895,	*Illinois.*
Hart, Henry George,	*Illinois.*
Heath, Clarence Wright,	
B.L. *(Univ. of Michigan)*, 1893,	*Michigan.*
Hixson, Robert Bruce,	*Minnesota.*
Hummel, Edward Percival,	*Iowa.*
Hurst, Everett May,	*Indiana.*
Hyde, Edward Everett,	
A.B. *(Knox Coll.)*, 1896,	*Illinois.*
Jakubowski, Siegfrid,	*Illinois.*
Johnston, Robert Moore,	
A.B. *(Wash. and Jeff. Coll.*, Pa.), 1895,	*Pennsylvania.*
Just, Guy Horatio,	*Illinois.*
Kattenbracker, Harry,	*Iowa.*
Kerrigan, George Peter,	*Illinois.*
King, Louis, Ph.G.,	*New York.*
Knauf, Frederick Peter,	*Wisconsin.*

Laben, George J.,	
B.S. *(Purdue Univ.)*, 1895,	*Indiana.*
Lang, John Michael,	*Illinois.*
Ling, Frank,	*Illinois.*
Lloyd, Claude Allen,	
A.B. *(Eureka Coll.)*, 1897,	*Illinois.*
Loope, Frank Roy,	*Michigan.*
Luehismann, Bernard,	*Norway.*
McAuliff, A. F.,	*Illinois.*
McCormick, Olin,	*Illinois.*
McConnell, John William,	*Illinois.*
McCray, Walter Robert,	
Ph.G. *(Univ. of Iowa)*, 1897,	*Iowa.*
Martin, Ernest Edwin,	*Iowa.*
Mason, Harry Philson,	*Iowa.*
Masilko, Vandy Frank,	*Illinois.*
Meany, John Joseph,	*Illinois.*
Meloy, J. Earle,	
A.B. *(Cornell Univ.)*, 1892,	*New York.*
Metz, Irvin T.,	
A.B. *(Indiana Univ.)*, 1895,	*Indiana.*
Miller, Bernard,	*Illinois.*
Miller, Gustav August,	*Illinois.*
Milroy, William D.,	
A.B. *(Indiana Univ.)*, 1894,	*Indiana.*
Moffett, William Nelson,	
B.S. *(Coe College)*, 1898,	*Iowa.*
Moldenhauer, Gustav Herman,	*Illinois.*
Monahan, Richard Charles,	*Iowa.*
Moody, Lewis,	
A.B. *(Augustana Coll.)*, 1895,	*Minnesota.*
Morgan, Mary Emma,	*Illinois.*
Morse, Mrs. Clara Kellogg,	*Michigan.*
Muehlmann, Carl George,	
Ph.G. *(Chicago Coll. of Pharmacy)*,	*Illinois.*
Murphy, Bernard E.,	*Illinois.*
Nier, William Jacob,	*Illinois.*
Norsman, Soren S.,	*Wisconsin.*
North, Francis Elbert,	*Illinois.*
Odoardo, Antonio Fredericks,	
A.B. *(Univ. of Havana)*, 1889,	*Cuba.*

Osborne, Claude Fenton,	*Iowa.*
Palmer, Ralph Fleetwood,	*Michigan.*
Parsons, Stephen Tylor,	*Illinois.*
Patterson, William Edward,	*Iowa.*
Phalen, James Matthew, Ph.G. *(Northwestern Univ.)*, 1892,	*Illinois.*
Pinkerton, Walter Jewett,	*Wisconsin.*
Potter, Ward Elverton, Ph.G. *(Northwestern Univ.)*, 1897,	*Illinois.*
Purcell, Harry Edward,	*Wisconsin.*
Rock, Henry Joseph,	*South Dakota.*
Rose, Felix,	*Wisconsin.*
Runyan, Chanler Preston,	*Indiana.*
Sargeant, Frank Loring,	*Iowa.*
Sassaman, Franklin W., M.D. *(Central Univ. of Kentucky)*, 1892,	*Indiana.*
Sears, George Lucien,	*Illinois.*
Seifert, Matthias Joseph,	*Illinois.*
Sheppard, Louis Delos,	*Illinois.*
Staehle, Max,	*Wisconsin.*
Syverson, Elmer Louis, B.L. *(Univ. of South Dakota)*, 1896,	*South Dakota.*
Taber, Roland Bert, Ph.C. *(Univ. of Michigan)*, 1896,	*Michigan.*
Teschan, Rudolph Freimuth,	*Wisconsin.*
Thompson, James Raymond,	*Iowa.*
Torney, Samuel James,	*Iowa.*
Turner, D. Ashley,	*Nevada.*
Twohig, Henry Edward-F.,	*Wisconsin.*
Tyson, Earle Henry,	*Iowa.*
Vincent, Henry Ansel,	*Wisconsin.*
Voight, Charles Bernard,	*Illinois.*
Voss, Carl, A.B. *(Royal Univ.,* Christiania, Norway), 1889,	*Illinois.*
Wall, Charles Delamere,	*Illinois.*
West, Theodore C.,	*Wisconsin.*
Westerlund, Joseph Emanuel, A.B. *(Augustana Coll.)*, 1895,	*Illinois.*
Xelowski, John Henry, Ph.G. *(Chicago Coll. of Pharmacy)*, 1887,	*Illinois.*

Yung, Julius Rudolph,	*Indiana.*
Zaleski, Joseph Pius, Ph.G. *(Univ. of Warsaw, Poland)*, 1891,	*Poland.*

SOPHOMORE CLASS

Ames, Andrew James,	*Minnesota.*
Annis, Reginald,	*Wisconsin.*
Apfelbaum, David,	*Illinois.*
Baumann, Fritz, Ph.D.,	*Germany.*
Bechtol, Charles Orville, A.B. *(Indiana Univ.)*, 1898,	*Indiana.*
Bentley, Frederick James,	*Illinois.*
Birk, J. W.,	*Ohio.*
Borden, Frank R., Ph.G. *(Northwestern Univ.)*, 1896,	*Wisconsin.*
Bracken, George Francis,	*Illinois.*
Brawley, Frank Ellis, Ph.G. *(Northwestern Univ.)*, 1897,	*Illinois.*
Buechner, F. E., Ph.G. *(Univ. of Illinois)*, 1897,	*Illinois.*
Burke, Edward Wilbur,	*Iowa.*
Burt, Charles Ward, B.S. *(Drake Univ.)*, 1896,	*Iowa.*
Buss, Francis Jacoby,	*Illinois.*
Cameron, Warren L.,	*Oregon.*
Carpenter, Cora White,	*Illinois.*
Cates, G. M.,	*Illinois.*
Colburn, George Alfred,	*Illinois.*
Conway, Hugh P.,	*Wisconsin.*
Corbett, George William, Ph.G.,	*Wisconsin.*
Corbus, B. Clark,	*Illinois.*
Chassell, John Langdon,	*Iowa.*
Cheng, Yung Peng,	*China.*
Church, Elmer E.,	*Illinois.*
Clark, Leslie Webb,	*Wisconsin.*
Crepler, R. Clinton, Ph.G. *(Northwestern Univ.)*, 1896,	*Illinois.*
Cunningham, William Dickson, A.B. *(Grove City Coll.)*, 1897,	*Pennsylvania.*
Denny, Alden Ray, Ph.B. *(Univ. of Iowa)*,	*Iowa.*
Dethlefsen, George Hans,	*Illinois.*

Dodson, Charles A.,	*Illinois.*
Domer, Walter A.,	*Indiana.*
English, Edward G.,	*Wisconsin.*
Garraghan, Edward Francis, A.B. *(St. Ignatius Coll.),* 1895,	*Illinois.*
Gorrell, Talbot John Home,	*Illinois.*
Gustafson, Joseph Ansley,	*Illinois.*
Heintz, Edward Louis, Ph.G. *(St. Louis Coll. Pharmacy),* 1898,	*Missouri.*
Helen, William Eugene,	*Illinois.*
Hess, William Clarance,	*Iowa.*
Holmberg, LeRoy John,	*Wisconsin.*
Hombach, William Peter,	*Iowa.*
Howard, Harry W.,	*Washington.*
Hunt, H. H.,	*Iowa.*
Johnson, Cecil C.,	*Iowa.*
Jordan, Marion S.,	*Iowa.*
Kaeser, Albert F., B.S. *(Univ. of Illinois),* 1898,	*Illinois.*
Kellogg, James Rossiter,	*Wisconsin.*
Kennedy, Josie C.,	*Illinois.*
Kirk, Alonzo Blackburn,	*Indiana.*
Kinder, Roscoe George William,	*Illinois.*
Koch, Wesley Alfred,	*Illinois.*
Lampe, Henry G.,	*Illinois.*
Lennon, Aloysius Joseph,	*Illinois.*
Leonard, Henry Sylvester, A.B. *(Miami Univ.),* 1898,	*Indiana.*
Liggitt, Flemming L.,	*Illinois.*
Little, Zack J.,	*Kansas.*
Lockhart, Carl Wright, Ph.G. *(Northwestern Univ.),* 1898,	*Wisconsin.*
Lorch, George John, Ph.G. *(Chicago Coll. of Pharmacy),* 1895,	*Wisconsin.*
Luehrs, Henry E.,	*Wisconsin.*
McClellan, Clarence, V.S. *(Ontario Veterinary Coll.)* 1891,	*Indiana.*
McCoy, William Merrill,	*Iowa.*
McDowell, W. D., B.S. *(Monmouth Coll.),*	*Illinois.*
McDowell, William Orrin,	*Iowa.*

McGuinn, James J.,	*Illinois.*
McPherson, Warren G.,	*Illinois.*
Major, Will, B.S. *(Eureka Coll.),*	*Illinois.*
Martin, Winfred B.,	*Illinois.*
Mortimer, Frank, B.S., C.E. *(Mass. Inst. Tech.),* 1897,	*Illinois.*
Morton, Frank R.,	*Illinois.*
Newman, William Manning,	*Minnesota.*
Noble, Charles Montague,	*Illinois.*
Oliver, Clifton I.,	*Iowa.*
Orcutt, Dwight Chapman,	*Illinois.*
Osborn, William Shelton,	*Iowa.*
Palmer, John Mathew,	*Wisconsin.*
Polson, Nina Dell,	*Missouri.*
Pratt, Mrs. J. Irene,	*Illinois.*
Rhodes, Ora M., B.S. *(Univ. of Illinois),* 1898,	*Illinois.*
Robertson, William F.,	*Iowa.*
Rolfs, Theodore Henry,	*Wisconsin.*
Rouse, Elmer E.,	*Michigan.*
Ruge, Edward Cornelius,	*Wisconsin.*
Ryon, Ralph Morton,	*Illinois.*
Sexton, Ira J.,	*Illinois.*
Scofield, Charles J.,	*Illinois.*
Sherwood, Hauphrey H., Ph.G. *(Northwestern Univ.),* 1894,	*Illinois.*
Soegaard, Erik,	*Illinois.*
Sommers, John Charles Julius,	*Wisconsin.*
Storck, William, Ph.G. *(Chicago Coll. Pharmacy),* 1889,	*Illinois.*
Streich, Edwin August, Ph.G. *(Northwestern Univ.),* 1898,	*Wisconsin.*
Struthers, Herbert Rankin, Ph.G. *(Chicago Coll. of Pharmacy),* 1893,	*Illinois.*
Talmage, George G.,	*Indiana.*
Taylor, Lucius Lorin,	*Wisconsin.*
Thomas, George H.,	*Illinois.*
Tillmont, Charles P.,	*New York.*
Turner, Agnes,	*Indiana.*
Ulrich, Julius Hirsch, Ph.G. *(Philadelphia Coll. Pharm.),* 1895,	*Illinois.*

Urquhart, Roy Thomas, *Indiana.*
VanHorne, James Apthorp, *Illinois.*
Wall, Frank J. A., *Illinois.*
Wallen, Vera W., *Illinois.*
Waskow, Otto G.,
Ph.G. *(U. of I. Coll. of Pharmacy),* *Illinois.*
West, E. Talmage,
A.B. *(Washington Coll.),* *Tennessee.*
Willing, Bertha Lillian, *Wisconsin.*
Wiltfong, Charles O., *Indiana.*
Zabokrtsky, Joseph, *Iowa.*

FRESHMAN CLASS

Aaron, William H., *Illinois.*
Agnew, J. Stanton, *Illinois.*
Ames, James Walton, *Wisconsin.*
Bartholomew, Philip Henry, *Pennsylvania.*
Beebe, Orville Everette, *Illinois.*
Beyer, Arthur E., Ph.G., *Iowa.*
Bice, Clyde William, *Iowa.*
Boynton, Lillian, *Illinois.*
Brown, Josiah Scott, *Illinois.*
Brown, R. E., *Ohio.*
Brownstein, Bernard, *Illinois.*
Burnham, Clarence Martin, *Illinois.*
Caldwell, Henry C., *Kansas.*
Cleary, John Henry, *Wisconsin.*
Coates, Lintsford B., *Illinois.*
Conant, Philo B., *Michigan.*
Conitz, Leopold Alexander, *Indiana.*
Court, Harry Marshall, *North Dakota.*
Day, Harriet M., *Illinois.*
Dean, Joseph, Jr., *Wisconsin.*
Donkle, Alfred DeForest,
Ph.G. *(Univ. of Wisconsin),* *Wisconsin.*
Dorn, Charles, *Minnesota.*
Dvorsky, B. J., *Illinois.*
Dwyer, John Condit, *Illinois.*
Everett, Henry H., *Illinois.*
Faeth, Victor P., *Ohio.*
Freeman, Wacoochee A., *Illinois.*

French, Wilbur M., B.L. *(Missouri Coll.)*,	*Missouri.*
Fuller, Francis Elmer,	*Michigan.*
Garrett, Emmett A.,	*Illinois.*
Grabow, Paul E.,	*Illinois.*
Groos, John O.,	*Michigan.*
Hahn, Louis August,	*Illinois.*
Hammers, Lewis J.,	*Illinois.*
Harrington, Charles W.,	*Wisconsin.*
Hartman, William M.,	*Wisconsin.*
Haynes, B. H.,	*Iowa.*
Henderson, Maurice L.,	*Iowa.*
Holmes, Edward M.,	*Illinois.*
Holmes, John Mont,	*Illinois.*
Hoxsey, Robert Patton, B.S.,	*Illinois.*
Ingersoll, Harriet T.,	*Illinois.*
Inks, Charles A.,	*Indiana.*
Jennings, Ralph E.,	*Indiana.*
Johnson, Wilbur V.,	*Illinois.*
Kaa, Niels A.,	*Illinois.*
Kirch, John P.,	*Wisconsin.*
Kitterman, Fred Raymond,	*Illinois.*
Kitterman, P. Gad,	*Iowa.*
Kittler, Walter Eugene,	*Wisconsin.*
Klehm, A. Louise,	*Illinois.*
Knox, Thomas P.,	*Wisconsin.*
Kurtz, Fred Baldwin,	*Indiana.*
Kyes, Sherman M.,	*Wisconsin.*
Lahodney, Charles J.,	*Illinois.*
Lane, Charles Sumner,	*Michigan.*
Larson, Charles Ludvig,	*Illinois.*
Leavitt, Frank J.,	*South Dakota.*
Leusman, E. Elsa,	*England.*
Lockwood, Charles Richard,	*Illinois.*
Low, Lew Morgan,	*Minnesota.*
Lunn, J. Martin,	*Wisconsin.*
Lyon, George Elmer,	*Illinois.*
McCarthy, Katherine Winifred,	*Illinois.*
McConvill, Bernard J.,	*Wisconsin.*
McKinney, I. Newton Charles,	*Illinois.*
Manning, F. Thomas,	*Wisconsin.*

Maris, Emilie R.,	*Minnesota.*
Meade, Frank Keith,	*Kansas.*
Merki, Emil J.,	*Illinois.*
Meyers, Judson Melvin,	*Wisconsin.*
Miller, George Lewis,	*Illinois.*
Miller, Noble W.,	*Illinois.*
Morris, Robert Wilson,	*New York.*
Murphy, T. Francis, A.B.,	*Illinois.*
Nadig, Vinton T.,	*Illinois.*
Phifer, Herbert Charles,	*Illinois.*
Piatt, W. B.,	*Illinois.*
Podgur, Maxwell,	*Illinois.*
Poinier, Edwin W.,	*Illinois.*
Potter, Charles A.,	*Illinois.*
Rodefeld, H. Henry,	*Illinois.*
Rosenthal, George Earnest,	*Illinois.*
Sabin, Alexander C.,	*Nebraska.*
Sawtelle, Henry Fenns,	*Illinois.*
Schoenberg, B.,	*Illinois.*
Shafer, H. O.,	*Indiana.*
Shelton, R. O.,	*Iowa.*
Sleyster, L. Rock,	*Wisconsin.*
Smiley, R. Borden,	*Wisconsin.*
Smith, G. W.,	*Illinois.*
Sprecher, Samuel,	*South Dakota.*
Standly, Kathryn,	*Missouri.*
Stegemain, Herman J.,	*Illinois.*
Tyvand, James C.,	*Wisconsin.*
Venn, Walter T.,	*Illinois.*
Vestling, V. I.,	*Illinois.*
Walvoord, Garret William,	*Wisconsin.*
Waufle, Guy C.,	*Illinois.*
Wells, William B.,	*Wisconsin.*
Whyte, Peter D.,	*Illinois.*
Wilson, J. M., B.L.,	*Illinois.*
Zohrlaut, George G.,	*Wisconsin.*

UNCLASSIFIED

Adams, Harry,	*Illinois.*
Anderson, W. J. J.,	*Illinois.*
Bassett, Fred,	*Illinois.*
Beach, Max,	*Illinois.*

Blahnik, Vencel L., Ph.G.,	*Illinois.*
Brooks, James D.,	*Illinois.*
Brown, Carver M.,	*Texas.*
Brown, J. Melvin,	*Illinois.*
Chittenden, H. W.,	*Missouri.*
Clark, A. B.,	*Illinois.*
Clemons, E. J.,	*South Dakota.*
Cowell, C. B.,	*Illinois.*
Donaldson, R. S.,	*Illinois.*
Edwards, B. A.,	*Illinois.*
Elliott, J. S.,	*Illinois.*
Emrich, G. L.,	*Illinois.*
Ernbrett, Helen,	*Illinois.*
Fales, E. N.,	*Illinois.*
Frankel, Henry A.,	*Illinois.*
Frazier, C. E.,	*Illinois.*
Gail, C. R.,	*Illinois.*
Garrettson, A. V.,	*Illinois.*
Gurley, E. L.,	*Ohio.*
Hague, A. S.,	*Illinois.*
Hallis, T. S.,	*Kansas.*
Hauff, Martha P.,	*Illinois.*
Hawkins, Walter,	*Illinois.*
Henderson, A. G.,	*Illinois.*
Hines, C. S.,	*Illinois.*
Hixson, Jessie,	*Michigan.*
Hoiby, Charles Oscar,	*Illinois.*
Hunt, Lister,	*Illinois.*
Johnson, T. O.,	*Illinois.*
Leist, Johanna,	*Illinois.*
Lowenrosen, A.,	*Illinois.*
Lodge, F. B.,	*Iowa.*
MacDonald, Charles,	*Illinois.*
McCauley, C.,	*Texas.*
McDowell, A. J.,	*Canada.*
McGarvey, W. R.,	*Indiana.*
Malcom, T. P.,	*Canada.*
Mercher, W. F.,	*Illinois.*
Merto, W. D.,	*Illinois.*
Neal, E. F.,	*Illinois.*
Phillips, Floyd, Ph.G.,	*Illinois.*

Reardon, Charles,	*Iowa.*
Rich, Mrs. K. B.,	*Illinois.*
Richter, A. J.,	*Illinois.*
Rightman, William Morris,	*Illinois.*
Rodsey, Adolph,	*Illinois.*
Rowe, F. C.,	*Illinois.*
Rudd, Eda,	*Texas.*
Scott, C. M.,	*Ohio.*
Schallenberger, W. B.,	*Indiana.*
Sinclair, George B.,	*Michigan.*
Spafford, W. B.,	*Illinois.*
Springer, C. F.,	*Canada.*
Steele, Don M.,	*Illinois.*
Stockton, William Clark,	*Ohio.*
Strauss, George,	*Michigan.*
Stokes, Arthur Charles,	*Nebraska.*
Swihart, C. S.,	*Illinois.*
Thompson, William Wilbur,	*Michigan.*
Tilton, Mae,	*Indiana.*
VanVleck, B. H.,	*Illinois.*
Wagner, George Alexander,	*Iowa.*
White, Roy M.,	*Illinois.*
Yoist, J. A.,	*Louisiana.*

SCHOOL OF PHARMACY

SENIORS

Arnold, George Edward,	*Illinois.*
Barnett, Moses,	*Indiana.*
Bartells, Charles Walter,	*Illinois.*
Biese, Carl August Bernhardt,	*Tennessee.*
Brady, Horatio Thomas Addis,	*Illinois.*
Bucholz, William John,	*Nebraska.*
Chism, John Samuel,	*Kansas.*
von Danden, Raymond,	*Illinois.*
Dauber, Adolph,	*Illinois.*
Davis, Cyrus Justin,	*Illinois.*
Davis, Leonard Watkins,	*Kansas.*
Eipper, August,	*Illinois.*
Elisburg, Louis Albert,	*Illinois.*
Fahrner, Pius Michael,	*Illinois.*

Gillette, Arthur,	*Michigan.*
Goeppner, George Christopher,	*Illinois.*
Gray, Margaret McClintock,	*Illinois.*
Greene, Grove,	*Michigan.*
Haeseler, Frank Preston,	*Iowa.*
Heidbreder, Albert Henry,	*Illinois.*
Hellmuth, Joseph Anthony,	*Illinois.*
Herbold, Charles,	*Illinois.*
Jansen, William Leonard,	*Illinois.*
Jewett, Harvey Claude,	*Illinois.*
Johnson, Alva Andrew,	*Wisconsin.*
Joubert, Louis Joseph,	*Illinois.*
Jungk, Walter August,	*Illinois.*
Lawrence, John Whitaker,	*Pennsylvania.*
Martin, John Wright,	*Georgia.*
Marvin, Zabina Earle,	*Michigan.*
Meinzer, Alonzo Edward,	*Iowa.*
Michelmann, Albert,	*Illinois.*
Mitchell, Jay Howard,	*Illinois.*
Mortland, Arthur Caldwell,	*Ohio.*
Munstermann, Henry Albert,	*Illinois.*
Nickerson, Howard Arthur,	*Ohio.*
Nims, Boyden,	*North Carolina.*
Phipps, Luther Hansford, M.D. *(Rush Medical Coll.)*, 1887,	*Illinois.*
Pick, Emil,	*Illinois.*
Pokorney, Frank Joseph,	*Illinois.*
Price, Walter Thomas,	*Texas.*
Reuter, William Conrad,	*Illinois.*
Robson, Andrew Jackson,	*Illinois.*
Samuelson, Carl John,	*Illinois.*
Schimelfenig, Charles Howard,	*Illinois.*
Schrodt, Jacob,	*Illinois.*
Seibert, Daniel Peter,	*Illinois.*
Smith, Frank George Douglas,	*North Dakota.*
Smith, Robert Clyde,	*Illinois.*
Snyder, William Edward,	*Illinois.*
Sturgas, Isa Belle,	*Iowa.*
Swanson, Harold Gideon,	*Illinois.*
Taylor, George Owen,	*Illinois.*
Taylor, Raymond Eugene,	*Illinois.*

Vannatta, Dewitt Snow,	*Illinois.*
Woelz, Frederick Wilhelm,	*Wisconsin.*
Zerbst, William,	*Illinois.*

JUNIORS

Alexa, Ludwik Frank,	*Illinois.*
Arnold, Almond Clifford,	*Michigan.*
Ballantine, Stewart,	*Illinois.*
Bank, Harry Lawrence Marie,	*Illinois.*
Banker, Edward Urias,	*Illinois.*
Batt, Herman,	*Illinois.*
Belmore, William Thomas,	*Illinois.*
Bilz, Michael Aloysius,	*Illinois.*
Bond, George Leslie,	*Illinois.*
Carmichael, Lewis Eber,	*Illinois.*
Caron, Walter,	*Illinois.*
Cholewinski, John Peter,	*Illinois.*
Dewitz, Otto John,	*Illinois.*
Dickey, Lilly A,	*Illinois.*
Dickelmann, Bernhard Frederick Herman,	*Illinois.*
Duffy, Michael Henry,	*Illinois.*
Fawcett, Jacob Theodore,	*Illinois.*
Fortin, William Henry,	*Illinois.*
Frain, Will Irvin,	*Indiana.*
Freburg, Amel Ernest,	*Illinois.*
Freeman, Roscius Wright,	*Wisconsin.*
Fulton, Peter MacMullen,	*Illinois.*
Goodman, Lewis,	*Illinois.*
Graham, William Rice,	*Illinois.*
Gregg, Maude Alma,	*Kansas.*
Hansen, Christian,	*Illinois.*
Hart, Benjamin Thomas,	*Illinois.*
Hobart, Mary Florence,	*Illinois.*
Hobart, Maude Finley,	*Illinois.*
Holderread, Walter,	*Illinois.*
Hollstein, Henry Charles,	*Illinois.*
Ives, George Smith,	*Illinois.*
Jackola, Abraham Arthur,	*Michigan.*
James, Clarence Lorenzo,	*Illinois.*
Jans, Albert,	*Illinois.*
Johnson, John August,	*Wisconsin.*
Kenney, Cornelius Edward,	*Wisconsin.*

Kiedaisch, George Arthur,	*Iowa.*
Klaverweiden, John Arnold,	*Illinois.*
Kreme, Frank Joseph,	*Illinois.*
Kucera, Anton,	*Wisconsin.*
Leemon, Charles Nathan,	*Illinois.*
Lestina, Joseph Matthew,	*Illinois.*
Letz, John,	*Wisconsin.*
Loan, James Michael,	*Illinois.*
Lofstrom, Frank Louis,	*Illinois.*
Machler, William George,	*Illinois.*
Mayer, Edward,	*Illinois.*
McGill, Charles Randolph,	*Illinois.*
McKinnie, Guy Leonard,	*Illinois.*
Mensching, William,	*Illinois.*
Monk, Louis,	*Illinois.*
Nechvatal, John Joseph,	*Illinois.*
Niemeyer, John,	*Iowa.*
Parker, Charles Wilbur,	*Michigan.*
Paul, George Henry,	*Wisconsin.*
Peel, Ernest,	*Kansas.*
Pettitt, Herbert Leroy,	*Illinois.*
Pfaff, Fred Louis,	*Illinois.*
Price, Moses Reuben,	*Illinois.*
Randack, Frank Joseph,	*Illinois.*
Reichmann, Albert,	*Illinois.*
Richmond, John Michael,	*Illinois.*
Rodenhouser, William Robert,	*Illinois.*
Rounds, Bird Cleo,	*Illinois.*
Safranek, Edward Jacob,	*Illinois.*
Salmon, Fred,	*Iowa.*
Samuels, John Jacob,	*Illinois.*
Scanlan, Walter Samuel,	*Illinois.*
Schmidt, Charles Henry,	*Illinois.*
Schmidt, Einar,	*Illinois.*
Schreiber, Louis,	*Nebraska.*
Scott, Paul Herman,	*Illinois.*
Seibert, Walter George,	*Illinois.*
Sees, Guy Deforest,	*Michigan.*
Seltzer, Bert,	*Illinois.*
Siebel, Ewald Hugo,	*Illinois.*
Silver, Emile,	*Illinois.*

Simons, Elden M,	*Michigan.*
Sneyd, Joseph Edward,	*Illinois.*
Solomon, Leo Kleinert,	*Illinois.*
Spangler, Newton Light,	*Pennsylvania.*
Stamm, Wenzel Alfred,	*Wisconsin.*
Stimson, Charlotte Elizabeth,	*Illinois.*
Susa, Joseph James,	*Illinois.*
Tether, Theodore Mason,	*Michigan.*
Trout, William,	*Indiana.*
Valbracht, Harry Daniel,	*Illinois.*
Vincent, Phillip Darius,	*Iowa.*
Ware, Frank Munson,	*Illinois.*
Warhanik, Alvernon Frank,	*Illinois.*
Webster, Charles Jeremiah,	*Illinois.*
Weible, Alfred Tennyson,	*Illinois.*
Welcome, Jacob Charles,	*Oregon.*
Wernli, Louis Samuel,	*Iowa.*
Weston, Willard,	*Illinois.*
Wulz, August Oscar,	*Illinois.*
Young, Wellington Wellesly,	*Iowa.*

SPECIALS

Fitzgerald, William Lydnes,	*Indiana.*
Geerlings, Isaac,	*Wisconsin.*
Xelowski, Thaddeus Zigismund, Ph.G. *(Chicago Coll. Pharmacy)*, 1896	*Illinois.*

PREPARATORY SCHOOL

Abbott, Ira Wilson,	*Danville.*
Alkire, Grace Ethel,	*Urbana.*
Alkire, Arthur Dwight,	*Urbana.*
Allen, John Newell,	*Hoopeston.*
Anderson, John William,	*Byron.*
Ashley, Burton Floid,	*Sibley.*
Baker, Charles Francis,	*Melrose.*
Barnett, Arthur,	*Hallsville.*
Bautz, Oscar Evans,	*Muncie.*
Bauer, Ralph Stanley,	*Champaign.*
Belknap, Henry Wales,	*Elgin.*
Biebinger, Marguerite,	*Milmine.*
Blanchard, Nathaniel Pearce,	*Champaign.*

Boulden, Darwin,	*Eddyville.*
Boyd, Laura Eunice,	*Palmer.*
Bragg, Lena May,	*DeLand.*
Buchanan, Gertrude,	*Urbana.*
Burrill, Mildred Ann,	*Urbana.*
Canton, Cecil Anthony,	*Beaver, Texas.*
Chance, Alonzo Roy,	*Urbana,*
Church, William Theodore,	*Jacksonville.*
Cline, James Stanley,	*Litchfield.*
Coe, John Edwin,	*Rochester.*
Coffman, Bertha J,	*Cisco.*
Coffman, Louie Mae,	*Cisco.*
Collins, Edra,	*Champaign.*
Conkling, Frank Koogler,	*Seymour.*
Conner, Thomas John Antoine,	*Prairie du Rocher,*
Coyle, John Frank,	*Penfield.*
Cutts, Emery,	*Lee.*
Damron, Charles Pleasant,	*Vienna.*
Daniels, Charles Edgar,	*Savoy.*
Day, Frederick Lathrop,	*Brimfield.*
Dempsey, David Ralph,	*Armington.*
Dickerson, George Hamm,	*Mahomet.*
Donoghue, William Joseph,	*LaSalle.*
Drummond, Roy,	*Fall Creek.*
Drury, Purne Omer,	*New Boston.*
Drury, Ralph Southward,	*New Boston.*
Eidmann, Gustav Herman,	*Mascoutah.*
Elkas, Isaac,	*Canton.*
Elliot, Roy G,	*Gilman.*
Ells, Burtis Claflin,	*Clarinda, Iowa.*
Fairchild, Sherman Dewitt,	*Sullivan.*
Farrin, William Otis,	*Cairo.*
Fisher, Clara Edna,	*Mahomet.*
Fiske, Charles Wesley,	*Mansfield.*
Fiske, Clarence Wilson,	*Sterling.*
Forbes, Marjorie Douglas,	*Urbana.*
Freeman, Roy Clinton,	*Homer.*
Gaffin, Charles Harold,	*Leaf River.*
Gardner, Eva,	*Blason.*
Gaston, David Newton,	*Tranquility, Ohio.*
Gates, Leslie Owen,	*Tuscola.*

Gibbs, Charlotte Mitchell,	*Riverton, Ky.*
Gibbs, Elizabeth Haywood,	*Riverton, Ky.*
Green, Carrie Elizabeth,	*Cherokee, Iowa.*
Grindley, Joseph Robert,	*Thomasboro.*
Harbeson, Davis Lawler,	*Cincinnati, Ohio.*
Harrington, Theodore G,	*Delavan.*
Harris, Estella,	*Modesto.*
Harris, Phil Baker,	*Quincy.*
Harrison, William Cullen,	*Ivesdale.*
Haüssler, Robert Edward,	*Centralia.*
Hecox, Roy,	*Champaign.*
Heffington, Roland,	*Batchtown.*
Howard, Lida Frances,	*Urbana.*
Howard, Wallace Lawton,	*Sheffield.*
Howe, John William,	*Cairo.*
Howe, Ralph Barnard,	*Urbana.*
Howell, Carrie Barnes,	*Champaign.*
Hulit, Clement Wilson,	*Canton.*
Jacobs, Manuel Joseph,	*Chicago.*
Johnsen, Charles William,	*Rankin.*
Jones, Edward James,	*Secor.*
Kuecken, Adolph Harry,	*Chicago.*
Kelso, Curtis Elmer,	*Thomasboro.*
Keusink, Wilhelmina Minnie,	*Champaign.*
Keusink, William,	*Champaign.*
Kilbury, Asa,	*St. Joseph.*
Kimmel, Howard Elihu,	*DuQuoin.*
Kincaid, Anna Laura,	*Athens.*
Kirby, Nellie Maye,	*Monticello.*
Knight, Albert Owen,	*Armstrong.*
Kofoid, Reuben Nelson,	*Normal.*
Linder, Elisha,	*Mattoon.*
Long, Troy Lovell,	*Morrisonville.*
Love, George Washington,	*Danville.*
McClure, Edgar Bradfield,	*Harrisonville, Ohio.*
McNeill, Jennie,	*Ficklin.*
McShane, John James Hugh,	*Ivesdale.*
Mahan, Jennie Mat,	*Chicago.*
Manning, Lewis LeRoy,	*St. Louis, Mo.*
Martin, James Walter,	*Wilmington.*
Matthews, Frederick Webster,	*Carlinville.*
Miner, Clement Leone,	*Winchester.*

Mowry, Mary Adah,	*Champaign.*
Mulvany, Thomas James,	*Jesup, Iowa.*
Mulligan, Frank,	*Kewanee.*
Nebeker, Milo Washington,	*Davenport, Iowa.*
Noble, Ernest Henry,	*Brocton.*
Onken, Louis Ernest,	*Harpster.*
Osterwig, Kinnie Adolph,	*Lee.*
Outhouse, Fred Myeine,	*Lily Lake.*
Parker, Robert Burns,	*Robinson.*
Parker, Roy Sheldon,	*Toluca.*
Pearce, Joseph Albert,	*Carmi.*
Perrigo, Lyle Donovan,	*Urbana.*
Prehm, Walter Fred,	*Chicago.*
Pritchard, Frank Preston,	*Broadlands.*
Pritchard, Ordie E,	*Newport, Ind.*
Quayle, Henry Joseph,	*Bondville.*
Ricker, Ethel,	*Urbana.*
Rose, Fred Wayland,	*Mazon.*
Ross, Robert Malcom,	*Chicago.*
Saunders, Thomas Earle,	*Ridge Farm.*
Schmalhausen, Louie Richard,	*Charleston.*
Scott, Philip Collins,	*Kempton.*
Settlemire, David Pearson,	*Litchfield.*
Sheppard, Hallie,	*Paris.*
Silliman, Guy Alexander,	*Carmi.*
Simpson, Clarence Oliver,	*Hindsboro.*
Smith, James Howard,	*Sidney.*
Smith, Obed Moses,	*Elburn.*
Smith, Roy,	*Colusa.*
Snyder, Bertren Eugene,	*Dalton City.*
Snyder, Elizabeth Vemba,	*Moweaqua.*
Sparks, Annie Elnora,	*Urbana.*
Spence, Will Potter,	*Macomb.*
Stahl, Garland,	*Elkhart.*
Stelle, Raleigh Benton,	*McLeansboro.*
Stinnett, Fred Welbourne,	*Carmi.*
Stone, Walter W,	*Mason City.*
Swanson, Charles Adolph,	*New Windsor.*
Switzer, Ernest Absalom,	*Farina.*
Thomas, Edgar Conrad,	*Newman.*
Thompson, Clarence,	*Champaign.*
Thompson, George Palmer,	*Steward.*

Thornton, Joseph James,	*Magnolia.*
Tobin, Louis Michael,	*Urbana.*
Tomlin, Milton Dell,	*Easton.*
Toops, Claude,	*Champaign.*
Tucker, Gertie Oakland,	*Urbana.*
Tucker, Walter Clifford,	*Brimfield.*
Tuthill, Lewis Butler,	*Anna.*
Vandeventer, Lloyd Thomas,	*Mt. Sterling.*
Walker, Louis Alfred,	*Ravenswood.*
Ward, Robert Russell,	*Benton.*
Watts, Anna Lyle,	*Fairland.*
Webber, Pearl,	*Urbana.*
Whitaker, George Hall,	*Davenport, Iowa.*
Whitney, Jay Asa,	*Lostant.*
*Wildman, Freeman,	*Atwood.*
Williams, Harry Clyde,	*Charleston.*
Williams, Simon,	*Illiopolis.*
Wilson, Nancy Maud,	*Guthrie,*
Wilson, William Andrew,	*Rosemond.*
Wingate, Bertha Thomas,	*Lovington.*
Wolf, Arthur Alfred,	*Farina.*
Woods, Riley Fassett,	*LaMoille.*
Wright, Lora,	*Urbana.*
Yates, Irving Brown,	*Dunlap.*
Youle, Claude M,	*Saybrook.*
Youle, Floyd Quincy,	*Saybrook.*
Zilly, Alice Rachael,	*Champaign.*

SPECIALS IN MUSIC

Besore, Hazel,	*Urbana.*
Bradley, Gertrude Gailress,	*Champaign.*
Breckenridge, Blanche Fargason,	*Urbana.*
Burrill, Irene Elsa,	*Urbana.*
Campbell, Luretta Beatrice,	*Champaign.*
Clark, Lorin,	*St. Joseph.*
Coar, Marjorie Belle,	*Urbana.*
Davidson, Hazel Frances,	*Champaign.*
Hanson, Mabel Irene,	*Urbana.*
Harp, Edith Lyle,	*Champaign.*
Harp, Katherine,	*Champaign.*
Laflin, Mary Elizabeth,	*Champaign.*
Steele, Eugene,	*Sidney.*

*Deceased.

SUMMARY OF STUDENTS, 1898-99

	Men.	*Women.*	*Total.*
GRADUATE SCHOOL	49	9	58
COLLEGES—			
Seniors	88	31	119
Juniors	95	37	132
Sophomores	133	33	166
Freshmen	196	52	248
Specials	68	76	144
Total	629	238	867
STUDENTS AT BIOLOGICAL STATION	11	4	15
WINTER SCHOOL IN AGRICULTURE	26	...	26
LAW SCHOOL—			
First year	33	1	34
Second year	27	1	28
Third year	2	...	2
Specials	7	...	7
Total	69	2	71
SCHOOL OF MEDICINE—			
Seniors	118	7	125
Juniors	107	6	113
Sophomores	98	7	105
Freshmen	96	7	103
Specials	60	8	68
Total	479	35	514
SCHOOL OF PHARMACY—			
Seniors	55	2	57
Juniors	93	5	98
Specials	3	...	3
Total	151	7	158
PREPARATORY SCHOOL	132	47	179
	1,497	333	1,830
Deduct counted twice	5	1	6
Total in University	1,492	332	1,824

DEGREES

Commencement Day, June 8, 1898, degrees were conferred as follows:

A.B.

D Edythe Beasley
William Wesley Black
Lee Byrne
William Wagner Dillon
Delbert Riner Enochs
Rollin Orlando Everhart
Fred Gates Fox
Alice Belle Frazey
William John Fulton
Fred Silvey Hall
Georgia Etherton Hopper
Leone Pearl House
Helen Jordan
Caroline Lentz
Joseph Hunter Marshutz
Edward Frederick Nickoley
Reed Miles Perkins
Cicero Justice Polk
William Vipond Pooley
Lewis Archibald Robinson,
Stanley Livingston Soper,
Joseph Clarence Staley
Guy Andrew Thompson
William Luther Unzicker,
Rufus Walker, Jr.
Sarah Emeline Webster
Lewis Forney Wingard
Minnie Barney Woodworth

B.S.

Philip Judy Aaron
Clark Godfrey Anderson
Jay Jennings Arnold
Fred Clarkson Beem
Erwin Howard Berry
Henry Cyrille Breidert
Lyle Ireneus Brower
Edwin Ladue Brockway
Guy Jacob Chester
Charles Albert Clark
Charles Richard Clark
Thomas Wiley Clayton
Edgar Francis Collins
Harry Clay Coffeen
Wallace Craig
Arthur R Crathorne
Chester Morton Davison
James Harvey Dickey
Harry Edwards Eckles
Claude Douglas Enochs,
Louis Engelmann Fischer
Stuart Falconer Forbes
Arthur Edwin Fullenwider
Henry Anthony Goodridge
Charles Ernest Hair
Morgan J Hammers
Thomas Milford Hatch
Don Hays
Arthur Burton Hurd
Albert Fred Kaeser
Nellie Ione Kofoid
Francis David Linn
Albert Carl Linzee
Charles James McCarty
Harry Monroe May
Henry Fleury Merker

Frederick Alexander Mitchell
Grace Eliot Morrow
John William Musham
Herbert John Naper
Andrew Henry Neureuther
John Nevins
Frederick William von Oven
Henry Mark Pease
George Joseph Ray
Ora M Rhodes
Rome Clark Saunders
Archibald Dixon Shamel
Albert Louis Thayer
Ferdinand Frederick Emil Toenniges
Charles Albert Walter
Joshua Percy Webster
Clyde Leigh Wetzel
Allison James Wharf
Albert St. John Williamson
Frederick Henry Wilson
James Thompson Wolcott
David Couden Wray
Herman Louis Wuerffel

LL.B.

Louis Maxwell Kent
Andrew Jackson Kuykendall
Roy Verner Spalding
George Bedell Worthen

B.L.S.

Grace Osborne Edwards

Ph.C.

Charles Albert Walter

A.M.

David Hobart Carnahan
Martha Jackson Kyle
William Grant Spurgin

M.S.

James Ansel Dewey
Adolph Hempel
George David Hubbard
Arthur Ernest Paul
Frederick William Schacht

M.L.

Nathan Austin Weston

M. Arch.

George Wesley Bullard

C.E.

Albert Claude Hobart

M.E.

Frank Lyman Busey

At the Commencement of the School of Medicine, April 19, 1898, degrees were conferred as follows:

M.D.

Victor V. Bacon
Henry Lester Baker
Walter S. Bebb
William Belitz
James M. Beveridge
M. Arista Bingley

David A. T. Bjorkman
Fred Hamilton Blayney
Darwin E. Brown
William Flocton Brownell
Jacob Bursma
J. Baptist Butts
Emery Marcus Byers
Leo L. Cahill
Bert Mather Carr
Amos Foster Conard
Frank Howard Conner
George E. Coon
John Francis Corbin
Alfred C. Crofton
Ira Hugh Dillon
Aloysius N. J. Dolan
William Tecumseh Dowdall
Robert Emmerson
Francis Sebastian Feeney
Bartholomew F. Flanagan
Geoffrey J. Fleming
Marcus Samuel Fletcher
Ward Redfield Ford
Amandus Ulysses Fuson
Samuel Carson Garber
Henry Bernard Graeser
Hugh Martin Hall
Thomas J. Hambley
Eunice Bertha Hamill
William Ernest Hart
George B. M. Hill
H. C. Homer
Martin Luther Hooper
John Henry Hovenden
Ernest Alexander Hunt
Charles Ellsworth Husk
Charles Stuart Hutchinson
Wentworth Lee Irwin
Simeon Ryerson Johnson
Felix T. Kalacinski
Oliver T. Kemp
Clarence Bruce King
Benjamin F. Kirkland
Charles Albert Kittredge
Eugene Colburn Knight
Arvid Ernest Kohler
Frank Benson Lucas
Elijah A. Lyon
Matthew E. McManes
Thomas Ulysses McManus
A. Baxter Miller
Patrick Robert Minahan
John Arthur Mutchler
John Stephen Nagel
James M. Neff
George F. Newhall
Timothy Van Buren Overton
Addison C. Page
Otto Hugo Pagelsen
William Robert Pennington
William Petersmeyer
Jennie Lind Phillips
Stephen Roman Pietrowicz
Fred D. Pratz
Charles P. Proudfoot
William Abraham Purington
Henry Courtland Rogers
Roy Allen Roszell
George Rubin
Paul Sheldon Scholes
Henry G. Schuessler
Franz F. H. Schuldt
Wesley Morley Sherin
Austin Ulysses Simpson
Charles E. Simpson
Daniel Gilmore Simpson
John H. Slater
Emanuel Frank Snydacker
George H. Sollenbarger
Harry Randolph Spickermon
William H. Stayner
William J. Steele

Bayard Taylor Stevenson
Carl Downer Stone
William Truman Stone
Charles Frederick Stotz
Henry J. Swink
William H. Vary
Olander E. Wald
William Godfrey Wegner
Willibald John Wehle
David Gillison Wells
Charles Franklin Whitmer
Frank B. Whitmore
Eugene D. Whitney
Louis G. Witherspoon
Milton Cyrus Wolf
John Jacob Wuerth
George Van Wyland
Charles Ira Wynekoop

At the Commencement of the School of Pharmacy, April 21, 1898, degrees were conferred as follows:

Ph.G.

Joseph Samuel Ashmore
George William Atzel
John Bakkers
Herbert Arthur Bauer
William Townzen Bowman
Bert Lemon Brenner
Harry Alexander Clark
Samuel Bricker Donaberger
Arthur Wardo Freeman
Andrew Hope Harris
William Frederick Herrmann
Axel Sanfred Holmsted
Hugh Benton Honens
Clyde Ernest Huddleston
George Jacob Kappus
Joseph Robert Kloppenburg
William Gabriel Joseph Kops
Ernest August Koropp
Bohumil Lauber
Bertram Maier
Otto Herman Mentz
Algy Charles Moore
Edward Paul Albert Neverman
Egil Thorbjorn Olsen
Charles Francis Rainey
Charles Theodore Frederick William Ruhland
Ziska Erhart Schuetz
Emil Henry Schultz
Frank Siedenburg
William Smale
Maximilian Sobel
William Stroetzel
Charles Reuben Thompson
Charles Augustus Warhanik
Mark Henry Watters
Henry Weigand, Jr.
Paul Harry Wiedel

Ph.C.

Charles Everett Jones

Honorary Degrees

Ph.M.

Nicholas Gray Bartlett
Henry Biroth
Ezekiel Herbert Sargent

HOLDERS OF SCHOLARSHIPS, PRIZES, AND COMMISSIONS

HONORARY SCHOLARSHIPS

Cook,	Barrett, George F.
Kendall,	Seely, Garrett T.
LaSalle	Clifford, Charles L.
Marshall,	Ponzer, Ernest W.
Ogle	Woolsey, Lulu C.
Whiteside,	Bradley, James C.
Williamson,	Capron, Clyde.
Winnebago,	Temple, Harry E.
Woodford,	Ray, Walter T.

STATE SCHOLARSHIPS

Bond,	Wolleson, Herbert.
Bureau,	Cook, William A.
Carroll,	Franks, Charles W.
Champaign,	Hartwick, Louis E.
Champaign,	Black, Alice M.
Champaign,	Draper, Charlotte E.
Christian,	DeMotte, Ruby Thorne.
Coles,	Frost, Frank G.
Cook, Fourth Senatorial District,	Greene, Charles T.
Cook, Fifth Senatorial District,	Schroeder, Curt A.
Cook, Ninth Senatorial District,	Rudnick, Paul F. A.
Cumberland,	Lindley, Walter C.
DeKalb,	Radley, Guy R.
DeWitt,	Tull, Effie M.
Douglas,	Boyd, John W.
DuPage,	Hinckley, Geo. C.
DuPage,	Farrar, Floyd J.
Edgar,	Thompson, McDonald.
Ford,	Barr, John.
Fulton,	Dobbins, Lester C.
Fulton,	Whitehouse, Edith U.
Iroquois,	Pletcher, Nuba M.
Iroquois,	Newton, Fred E.
Jo Daviess,	Doty, Lee B.

Kane,	Hoppin, Charles A.
LaSalle,	Olson, Joseph M.
Lee,	Burnham, Edna S.
McHenry,	Gilkerson, Aletha,
McLean,	Hartrick, D. Clara,
McLean,	Reardon, Neal D.
Macon,	Woods, William T.
Macon,	Lytle, Ernest B.
Macoupin,	Otwell, Allen M.
Madison,	Roa, William J.
Montgomery,	Barry, George R.
Montgomery,	DeMotte, Roy J.
Moultrie,	Harshman, Lucius R.
Ogle,	Brayton, Louis F.
Ogle,	Waterbury, Leslie A.
Piatt,	Mitchell, Annie.
Piatt,	Hinkle, Ida M.
Piatt,	Dawson, Charles H.
Pope,	Bell, Arthur T.
St. Clair,	Updike, Hector,
Sangamon,	Marsh, Albert L.
Stark,	Stewart, Miles V.
Stark,	Berfield, Clyde,
Stephenson,	Fisher, John W.
Tazewell,	Zipf, Ferdinand.
Vermilion,	Hayes, Z. Bernice.
Vermilion,	Stanley, Otis O.
Warren,	Malcolm, Charles W.
Whiteside,	Warner, Harry J.
Will,	Reeves, George I.

CHICAGO CLUB LOAN FUND

Mesiroff, Josef.

WINNER OF HAZELTON PRIZE MEDAL

Fullenwider, Thomas Irvin.

COMMISSIONS AS BREVET CAPTAIN ILLINOIS NATIONAL GUARD, ISSUED BY THE GOVERNOR IN 1898

Arthur R. Crathorne, Delbert R. Enochs, Harry M. May, Ora M. Rhodes, Albert S. Williamson, Herman L. Wuerffel.

INDEX

UNIVERSITY OF ILLINOIS

COLLEGE OF AGRICULTURE

REVISED COURSE OF STUDY ADOPTED AUGUST 16, 1899

Students desire instruction in agriculture with one of two definite objects in mind:

1. To secure a liberal education along agricultural lines through a course of study leading to graduation.

2. To take instruction in certain subjects for the sake of technical knowledge and skill without reference to graduation.

To meet the needs of both classes of students the following courses are offered. Each subject is briefly outlined to show its general character, and is followed by a notation of the length of time and of the nature of preparation necessary for its pursuit. The liberal range of subjects affords wide elective privileges to those expecting to graduate and also permits the special student to follow out his chosen subjects at considerable length. Every subject is open to any student whose preparation is sufficient to enable him to pursue the study with profit.

Subjects marked thus * require at least regular admission to the University or its equivalent.

PRESCRIBED SUBJECTS AND COURSE

Regular students, candidates for the degree of B.S. in Agriculture, are required to take the following subjects:

Subject.	*Hours.*
Agronomy 1, 2, 4	13
Animal Husbandry 2	5
Botany 5	5
Chemistry 1, 3b, 4	10
Dairy Husbandry 5	2½
Horticulture 1, 7	7
Military 1, 2	5
Physical Training—	
Men 1, 2	2½
Women 7, 9	3
Rhetoric 2	6
Thesis	5
Veterinary Science 6	2½
Zoölogy 7	5

In addition the student must earn 15 hours from Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, Veterinary Science; 10 hours from Botany 1, 2, Geology 3, and Zoölogy 1, 2; and 33½ hours from other courses offered in the University.

The work for the first year is prescribed and is as follows:

I. Agronomy 1; Animal Husbandry 2; Chemistry 1; Horticulture 1; Military 1, 2; Physical Training 1, 3 or 7, 9.

II. Agronomy 2; Chemistry 3b, 4; Dairy Husbandry 5; Horticulture 1; Military 1, 2; Physical Training 1, 3, or 7.

After the first year the elective privilege is large, but the individual student should so arrange his work as to secure the subjects that are prescribed, and also meet the conditions precedent to subjects he may desire to elect. The total number of semester hours required for graduation is 130.

Students, not candidates for a degree, may be admitted as special students to any of the subjects listed which their previous preparation will enable them to pursue with profit.

DESCRIPTION OF COURSES

[I. means first semester; II. means second semester. Numbers not in parenthesis refer to the recitation periods and numbers within parenthesis indicate the credit allowed for the study. For significance of the * see paragraph No. 2, first page.]

AGRONOMY (FIELD CULTURE)

1. FARM MECHANICS.—Farm machinery, different kinds and their efficiency, draft, durability, cost and care, and losses from improper management. Laying out and construction of drains and calculation of their capacity and cost. Location, internal arrangement, and design of farm buildings. *I.; M., W., F.; 1 and 2;* (*3*). Mr. CRANE.

2. FARM CROPS.—A study of the cultivated plants of the farm, their nature and requirements; the leaf and root development, and the conditions of successful growth; vitality of seed and methods of preservation, varieties; judging by standard samples and possibilities of improvement by selection and breeding: adaptation of varieties to locality and soil; management of pasture lands; distribution of the crops of the United States. Identification of weeds and weed seeds, and methods of destroying weeds, insects, and fungous enemies. *I. and II.; daily; 3 and 4;* (*5*). Mr. SHAMEL.

*3. SOIL PHYSICS.—Origin and classes of soils.—Conditions and indications of fertility. The physical and chemical constitution of soils, and the consequent effect of drainage, cultivation, cropping, and manures upon their mechanical condition, their relation to the movements of water and of air, their retention of fertility, and their capacity to produce, and upon root extension. *II.; daily; 3 and 4; (5).* Mr. WARD.

Required: One year of University work or its equivalent in Chemistry or Physics.

*4. SOIL BACTERIOLOGY.—Relation of bacteria to productive soils and growth of agricultural crops. *II.; daily; 6 and 7; (5).* Mr. WARD.

Required: Botany 5.

*5. FERTILITY.—The influence of fertility, natural or applied, upon the yield of various crops; the effect of the crop upon the soil, and upon succeeding crops; different rotations, and the ultimate effect of systems of farming upon the productive capacity of soils; finally, the application of all to Illinois soils and conditions. *II.; daily; 1 and 2; (5).* Professor HOLDEN.

Required: Two years of University work, including Chemistry 1, 3b, 4.

6. FARM MANAGEMENT.—Economic bestowal of the labor of the farm, and the profitable use of machinery; plowing, methods and systems in use and the advantages and disadvantages of each; different methods of raising and harvesting crops and the comparative efficiency and cost of each. The place of special crops, of live stock, and fencing in the economy of the farm. Disposal of crops by marketing and by home consumption. *I., daily; 4; (5).* Professor HOLDEN.

7. HISTORY OF AGRICULTURE.—Its development and practice, Roman, English, and American. *I.; Tu., Th.; 1; (2).* Mr. WARD.

*8. COMPARATIVE AGRICULTURE.—Influence of locality, climate, soil, race, customs, laws, religion, etc., upon the agriculture of a country, and incidentally upon its people. One crop only, and its effect, as rice; Indian corn in American agriculture and affairs. Varying conditions under which the same crop may be produced, as wheat. Statistical agriculture. Influence of machinery and of land titles, whether resting in the government, in landlord, or in occupant. Relation of agriculture to other industries and to the body politic. *II.; M., W., F.: 2; (3).* Professor DAVENPORT.

Required: Two years of University work.

*9. AGRICULTURAL EXPERIMENTATION.—A systematic study of the work of experiment stations and experimenters in this and other countries, together with a critical study of correct principles and methods of experimentation, designed for such students as desire to fit themselves for work in original investigation in experiment stations or elsewhere. *II.; daily; 6; (5).* Professor DAVENPORT and Professor HOLDEN.

Required: Two years' work in Agriculture.

10. METEOROLOGY.—General principles of meteorology with special reference to agricultural conditions. *I.; Tu., Th.; 3; (2).* Mr. WARD.

11. *THESIS UPON INVESTIGATION UNDER DIRECTION OF INSTRUCTOR.—*I. and II.* Professor HOLDEN.

ANIMAL HUSBANDRY

1. THE BREEDS OF DOMESTIC ANIMALS.—Their history and character; pedigree registers and tracing pedigrees; location of the pure-bred breeds of the United States; recognition of pure-bred animals at sight; daily practice in judging. *I.; daily; 6 and 7; (5).* Mr. KENNEDY.

*2. STOCK JUDGING.—Critical study of beef, pork, and mutton cuts, and judging animals for meat production; study of wool and judging sheep for wool; judging for the dairy and for labor, driving and speed, critical study of breed types and of pure-bred animals; live stock statistics. Lectures, reference readings, and practice in judging. *I.; daily; 6 and 7; (5).* Mr. KENNEDY.

3. LIVE STOCK MANAGEMENT.—Housing and care of farm animals and their surroundings, barns, stables, yards, management of breeding animals, and training of horses for labor, driving, and saddle. Lectures and reference readings. *I., second half; daily; 4; (2½).* Mr. KENNEDY.

*4. STOCK FEEDING.—Study of foods, their chemical composition, potential energy, and mechanical condition as well as their proper combination looking to the economic production of meat, milk, wool, or labor, and the development of the young. *I.; daily; 3; (5).* Professor DAVENPORT.

*5. STOCK BREEDING.—The improvement of domestic animals through the principles of heredity, variation, and selection and the influence of environment; critical study of breeders' methods and results. *II; daily; 3; (5).* Professor DAVENPORT.

*6. MINOR.—The place of live stock in American affairs; the types most needed; the several characters of the principal breeds and the leading features of live stock management. Lectures. Designed for University students specializing in other lines than animal husbandry. *II., second half; daily; 5; (2½).* Professor DAVENPORT.

7. HORSES.—Exhaustive study of breeding types, management, and market interests. For special students desiring particular instruction in horses. Lectures each week, reference reading and individual study, and practice in judging. *II.; daily; 3 and 4; (5).* Mr. KENNEDY.

8. CATTLE.—Same as with horses and under same condition. *I.; daily; 3 and 4; (5).* Mr. KENNEDY.

9. SHEEP.—Same as with horses and cattle. *II., first half; daily; 1 and 2; (2½).* Mr. KENNEDY.

10. SWINE.—Same as with sheep. *II., second half; daily; 1 and 2; (2½).* Mr. KENNEDY.

*11. THESIS REPRESENTING INDIVIDUAL WORK OF THE STUDENT. *I. and II.* Professor DAVENPORT.

DAIRY HUSBANDRY

1. MILK.—Composition; testing for fat and total solids with the Babcock test and the lactometer; detection of adulteration; souring and means of contamination and methods of protection from impurities and infection; care of utensils, care and handling of milk and its delivery to the customer. *I., first half; daily; 4; (2½).* Mr. FRASER.

2. MILK PRODUCTION.—Economical production of milk as regards cheapest and best feeds, proper care and management of the dairy herd, arrangement and care of the dairy barn. A study of variations in milk and their causes; efficiency of different cows as milk and butter producers. *I., second half; daily; 3; (2½).* Mr. FRASER.

3. CREAM SEPARATION.—Efficiency of the shallow pan, deep setting and separator systems of creaming. Care, management, and comparison of the different centrifugal separators. *II., first half; daily; 1 and 2; 2½).* *Mr.———.

*4. BUTTER MAKING.—Ripening of cream, the acid test; use and advantage of the different starters; effect of temperatures, acidity, and ripeness of cream upon time and completeness of churning, and quality of butter; packing, scoring, and marketing of butter. *II., second half; daily; 1 and 2; (2½).* *Mr.———.

Required: Dairy Husbandry 3, and either 1 or 2.

*5. MINOR.—Testing of milk for butter fat and total solids; advantage of cleanliness in milk production; separation of cream by different methods, and the making of butter. Designed for agricultural students and others meeting entrance conditions to the University. *II., first half; daily; 1 and 2; (2½).* Mr. FRASER and *Mr.———.

6. CHEDDER CHEESE.—Care of milk for cheese making; the rennet test; setting; cutting; heating; milling; salting and pressing the curd curing and judging for cheese. *I., first half; daily; 6 and 7; (2½).* *Mr. ———. [Not offered 1899-00.]

7. FANCY CHEESE.—Method of manufacture, care, and sale of many varieties of fancy and hand cheese. *I., second half; daily; 6 and 7; (2½).* *Mr. ———. [Not offered 1899-00.]

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* Vacancy will be filled at once.

8. PASTEURIZATION.—Effect of pasteurization on flavor and keeping quality of milk and cream and products made from these. *II., first fifth; daily; 1 and 2; (1).* *Mr. ———.

9. CREAMERY MANAGEMENT.—Planning and construction of creameries and cheese factories with reference to sanitation and economy of operation; management, coöperative and company; care of boilers and machinery. *II., first half; 6 and 7; (2½).* Mr. *———.

Required: One semester of dairy work or its equivalent.

*10. DAIRY BACTERIOLOGY.—Relation of bacteria to dairying. Where and to what extent bacteria gain access to milk and how this may be avoided in actual practice. Action of bacteria on milk and its products. *II.; daily; 3 and 4; (5).* Mr. FRASER.

Required: Botany 5.

*11. THESIS UPON INVESTIGATION CONDUCTED UNDER DIRECTION OF INSTRUCTOR. *I. and II.*

HORTICULTURE

1. MINOR.—A study of orchard fruits and other horticultural plants. Lectures, reference reading, and laboratory work. *I., Tu., Th.; 2; alternate Saturdays; 1, 2, 3; (2½). II., last half; Tu., Th.; 2; alternate Saturdays; 1, 2, 3; (1½).* Assistant Professor BLAIR and Mr. LLOYD.

2. ORCHARDING.—Comprising a study of orchard fruits. *I.; daily; 3; (5).* Assistant Professor BLAIR.

Required: Horticulture 1.

3. SMALL FRUIT CULTURE.—*II., M., W., F.; 3; (3).* Mr. LLOYD.

Required: Horticulture 1.

4. VEGETABLE GARDENING.—Kitchen and market gardening, and vegetable forcing. *II.; daily; 1; (5).* Mr. LLOYD.

Required: Horticulture 1.

*5. PLANT PROPAGATION.—Methods of securing and perpetuating desirable varieties of self and cross-fertilization, or by hybridization and selection. *II.; M., W., F., 4; (3).* Assistant Professor BLAIR and Mr. LLOYD.

Required: Horticulture 2.

*6. FORESTRY.—Embracing a study of forest trees and their natural uses, their distribution and artificial production. *II.; Tu., Th., 3; (2).* Professor BURRILL.

Required: Botany 2.

*7. LANDSCAPE GARDENING.—Ornamental and landscape gardening with special reference to the beautifying of home surroundings. *II.; M., W., F.; 3; (3).* Assistant Professor BLAIR.

*8 VITICULTURE.—A comprehensive study of grape culture. *I.; Tu., Th.; 4; (2).* Assistant Professor BLAIR.

Required: Horticulture 1.

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* Vacancy will be filled at once.

*9. FLORICULTURE.—The study and management of conservatory and house plants. *I. and II.; M., W., F.: 5; (3).* Assistant Professor BLAIR.

Required: Botany 2. [Not given 1899-00.]

*10. NUT CULTURE.—The cultivation and management of nut trees for commercial purposes. *I.: Tu., Th.; 1: (2).* Assistant Professor BLAIR.

Required: Horticulture 3. [Not given 1899-00.]

*11. SPRAYING.—Materials and methods employed for the combating of insects and fungous diseases of plants. *I. and II.; Tu., Th.; 5; (2).* Mr. LLOYD.

Required: Horticulture 3.

*12. PLANT HOUSES.—The construction and management of conservatories and other plant houses. *I.; M., W., F.; 1; (3).* Assistant Professor BLAIR and Mr. LLOYD.

Required: Horticulture 6.

*13. ECONOMIC BOTANY.—A study of cultivated plants with special reference to their economic uses. *I.; daily; 1 and 2; (5).* Professor BURRILL.

Reqired: Botany 2. [Not given 1899-00.]

*14. EVOLUTION OF CULTIVATED PLANTS.—Comprising a study of organic evolutions and modifications of plants under the hand of man. *I.; daily; 7; (5).* Assistant Professor BLAIR.

Required: Two years of University work or its equivalent.

15. NURSERY METHODS AND MANAGEMENT.—Designed for those who intend to make the nursery business a life work. *II.; daily; 6; (5).* Assistant Professor BLAIR and Mr. LLOYD.

16. COMMERCIAL HORTICULTURE.—A course giving a practical training for those students intending to follow horticulture as a business. *I. and II.; daily; 8; (5).* Assistant Professor BLAIR and Mr. LLOYD.

*17. EXPERIMENTAL HORTICULTURE.—A course for those intending to engage in professional horticulture, or experiment station work. For advanced students. *I. and II.; M., W., F.; 6 and 7; (3).* Assistant Professor BLAIR.

Required: Two semesters of work in horticulture.

*18. SPECIAL INVESTIGATION AND THESIS WORK. Required of candidates for graduation. *I. and II.; M., W., F.; 3, 4, 5; (3).* Professor BURRILL and Assistant Professor BLAIR.

VETERINARY SCIENCE

1. ANATOMY.—A thorough knowledge of the structure of the horse and other domestic animals. The instruction comprises lectures, demonstrations, and dissections. The lectures include a description, first,

of the locomotary apparatus, viz., the bones, articulations, and muscles; second, of the viscera; third, of the relation of the blood vessels and nerves and of the brain and organs of the senses. The lectures are illustrated by drawings, models, and specimens from recent subjects. *I.; M., W., F.; 1; (3).* Professor McINTOSH.

2. PHYSIOLOGY.—The purpose of this course is to make students thoroughly acquainted, so far as time permits, with modern physiology; its methods, its deductions, and the basis on which the latter rests. Lectures and frequent quizzes. *I.; daily; 2; (5).* Professor McINTOSH.

3. MATERIA MEDICA.—The instruction includes theraputics, toxicology, pharmacy, prescription writing, etc. The lectures of this branch will be illustrated by a large collection of specimens of the various drugs, both in their crude and prepared state, as used by veterinarians, so that the student may become familiar with the mode of administering the various drugs. *I. and II.; daily; 3; (10).* Professor McINTOSH.

4. THEORY AND PRACTICE OF VETERINARY MEDICINE AND SURGERY.—Lectures on the general pathology of the domestic animals. Owing to the inability of animals to describe their ailments symptomatology is very minutely considered, and physical diagnosis is made particularly prominent. Autopsies will be held on every subject, to familiarize the student with the morbid condition of the disease. In addition to these, anatomical and pathological specimens, charts, diagrams, etc., will be exhibited. *II.; daily; 2; (5).* Professor McINTOSH.

*5. VETERINARY SANITARY SCIENCE.—This branch is taught by a series of lectures embracing inspection of cattle, horses, sheep, and pigs for contagious diseases; a discussion of the influence of civilization and traffic on animal plagues, their origin and nature, diffusion, reception, and mode of access; the prevention and suppression of contagious diseases. *I., daily; 1; (5).* Professor McINTOSH.

6. MINOR.—Diseases of farm animals, materia medica and clinic work. *II.; second half; 1; 2½).* Professor McINTOSH.

Clinic instruction is given once a week throughout the year.